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STATE DOCUMENTS

Water Resources Survey

MADISON COUNTY WATER RESOURCES SURVEY PART 1

Part I:

HISTORY OF LAND AND WATER USE ON IRRIGATED AREAS

Madison County, Montana

Published by
STATE ENGINEER'S OFFICE
Helena, Montana, July, 1954

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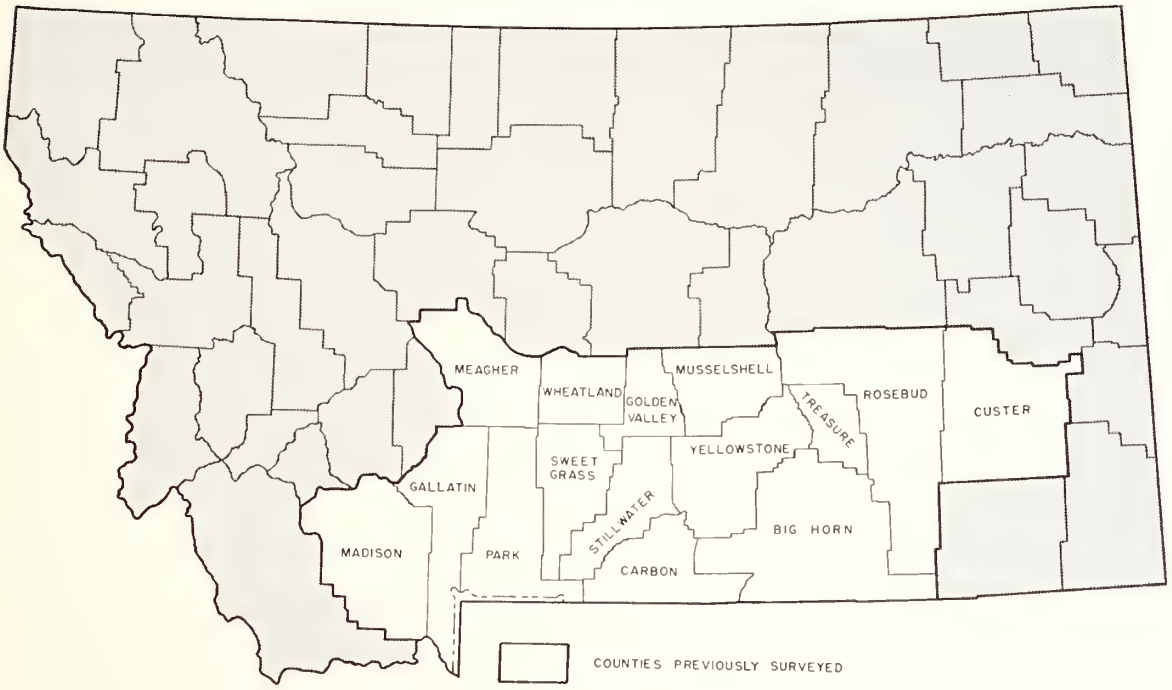
WATER RESOURCES SURVEY

MADISON COUNTY
MONTANA

Part I

History of Land and Water
on Irrigated Areas



Published by
STATE ENGINEER'S OFFICE
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July, 1954

Honorable J. Hugo Aronson
Governor of Montana
Capitol Building
Helena, Montana

Dear Governor Aronson:

Submitted herewith is a consolidated report on the Water Resources Survey of Madison County, Montana.

This work is being carried on with funds made available to the State Engineer by the 33rd. Legislative Session, 1953, and in cooperation with the State Water Conservation Board and the Montana State Agricultural Experiment Station.

The report is divided into two parts. Part I consists of history of land and water use, irrigated lands, water rights, etc., and Part II contains the township maps in the county showing in color the lands irrigated from each source or canal system.

Work has been completed and reports are now available for the following counties: Yellowstone, Carbon, Stillwater, Big Horn, Custer, Rosebud, Musselshell, Golden Valley, Wheatland, Meagher, Sweet Grass, Park, Treasure, Gallatin, and Madison.

The office files contain minute descriptions and details of each individual water right, water and land use, etc., which are too voluminous to be included herein. These office files are available for inspection to those who are interested.

The historical data on water rights contained in this report can never become obsolete. If new information is added from time to time as new developments occur, the report can always be kept current and up to date.

Respectfully submitted,

FRED E. BUCK, State Engineer

ACKNOWLEDGMENTS

A survey and study of water resources involves many phases of both field and office work in order to gather the necessary data to make the information complete and comprehensive. Appreciation of the splendid cooperation of various agencies and individuals who gave their time and assistance in aiding us in gathering the data for the preparation of this report is here acknowledged.

Madison County Officials

John W. Lasich, Commissioner — W. H. McKenzie, Commissioner
John E. Krauss, Commissioner
Pearl S. Beardsley, Clerk and Recorder
Paul H. Love, Clerk of District Court
H. C. Bosworth, Surveyor — Oliver Kendall, Assessor

History and Organization—"Inventory of the County Archives of Montana"
Rita McDonald—"Authenticity of History"—Librarian-Archaist, State Historical Library
R. A. Dightman—"Climate"—Section Director, U. S. Weather Bureau
W. Clinton Bourne—"Soils"—Research Associate, Agricultural Experiment Station
Ed Atkins—"Crops and Livestock"—County Agent
Frank Stermitz—"Stream Gaging Stations"—U. S. Geological Survey
U. M. Sahinen—"Mining"—State of Montana Bureau of Mines and Geology
John P. Robinson—
"Soil Conservation Districts"—Work Unit Conservationist
Harry W. Baker, Jr.—
"U. S. Fish and Wildlife Service"—Supt., Fish Cultural Station
Carl W. Simpson—
"Beaverhead Nat'l Forest"—Acting Forest Supervisor, Forest Service
C. J. Cox—Secretary, Baker Ditch Co.
Secretary, Beaverhead Co-op Ditch Co.
G. Lasich—Secretary, Big Hole Co-op Ditch Co.
Axel Nelson—Secretary, Creeklyn Ditch Co.
Paul Love—Secretary-Treasurer, O'Dell Ditch Co.
Grace Butts—Secretary-Treasurer, Pageville Canal Co.
Mrs. Edna Kibler—Secretary, Parrot Ditch Co.
Frank E. Blair—Secretary-Treasurer, Indian Creek Ditch and Irrigating Co.
Mrs. Jack Cowan—Secretary, Three Creeks Water Co.
Tom S. Hughes—Secretary-Treasurer, West Madison Canal Co.
Harry T. Norton—Secretary, Ruby River Storage Project
Mrs. Charles H. Purdom—Secretary, Willow Creek Storage Project

The State Engineer's Office, Water Resources Survey, hereby expresses sincere appreciation to the many ranchers, farmers, and stockmen who have given their helpful cooperation in this survey.

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FOREWORD

In nearly all of the 17 Western Reclamation States a water right is obtained by first making a filing with some legally designated central state agency—usually the State Engineer's Office—setting forth the amount of water desired and the area proposed to be irrigated. A study is then made of the sufficiency of the water supply, and, if found adequate, a permit for the use of the water is issued and recorded. If studies show that the stream is depleted, the application is denied. The procedure in Montana, however, is vastly different.

In Montana the right to the use of water from a stream not adjudicated by the courts may be acquired in one of two ways. First, by posting a notice on the stream and filing a copy of same in the office of the County Clerk of the county wherein the appropriation is located and then proceeding to divert and use the water. Secondly, a person may divert and use water from a stream without posting or filing notice, in which case a water right based thereon has been recognized as valid by the courts. Whenever it becomes necessary to adjudicate the stream both methods of acquiring rights have been recognized by the courts and the amount of water finally decreed and dates of priority in either case are determined by the evidences and proofs.

Under Montana law there is no restriction as to the amount of water one may designate in his notice of appropriation. As a consequence, the amount set forth in the filing in no way indicates the amount being diverted and used, nor does it show whether or not the water was ever used at all to perfect the right. Furthermore, there is no relationship whatsoever between the amount of water filed on and the normal flow of the stream. To further complicate this matter there is no law of abandonment in Montana. Action must be brought in court to abandon a right, which makes it almost impossible to prove abandonment if the defendant wishes to oppose the action.

There is no central office in the State where recordings are filed, or any supervision over the distribution of water from unadjudicated streams. The distribution of water from adjudicated streams is supervised entirely by the District Court that handed down the decree. One wishing to study the validity of a water right on a stream not adjudicated must make a search of the county records wherein the stream is located in perhaps two, three, or more counties if the stream courses through them. About the only result one will accomplish by such a research will be a tabulation of the dates of filing. The amounts of water filed on will be of no consequence, there is no conclusive evidence that the recorded appropriations have been perfected, and there is no record of the rights which are being used but never recorded. Therefore, a purchaser of ranch property, where he has to depend upon irrigation from a stream that is not adjudicated, has no way of determining the validity or priority of his water right. He has no assurance of the value of the right until the stream is adjudicated by the court, when each claimant must prove his claim by material witnesses.

The pioneers who are able to offer direct testimony in adjudication suits are rapidly passing. One phase of this Water Resources Survey is to obtain all of the first-hand information possible on water and land use from the "old-timers" who are left, before it is too late. These data will include every known water right up to the time of completing the work in the respective counties, and the information is on file for inspection in the State Engineer's Office. At the time of this publication, work has been completed and reports are available for the follow-

ing counties: Yellowstone, Carbon, Stillwater, Big Horn, Custer, Rosebud, Musselshell, Golden Valley, Wheatland, Meagher, Sweet Grass, Park, Treasure, Gallatin, and Madison. A person having interests in lands located in any of the above-named counties may obtain a good idea of the sufficiency and priority of the water rights appurtenant to the land in question after studying the records in the State Engineer's Office.

In this and succeeding volumes of the data compiled by this Water Resources Survey, it is the intention to provide as much information as is possible relative to the water right records of the various counties, as well as to assemble such other information as may be available from all sources having knowledge of these various water rights. Every precaution is being taken to avoid errors in the compilation of these data.

The results of this work, in the counties affected, proved to be very valuable and necessary in negotiating the Yellowstone River Compact between the states of Wyoming, North Dakota, and Montana. In arriving at an equitable division of the waters between the states, it was necessary for Montana to have a catalog of its irrigated land and water use. In the dispute with Canada over the use of water from Sage Creek, an international stream, the water resource survey played a very valuable part in justifying our uses for irrigation. This same question will undoubtedly arise in other river basins. It is highly important that Montana gather such data, and thereby be able to defend its water rights in the development of the great river basins of the Missouri and Columbia rivers and the international streams between Canada and Montana.

The subject of water rights is coming more and more into prominence as the rapid expansion of our irrigated area proceeds under the impetus of both State and Federal development programs. As new canals are dug and old canals and ditches are enlarged and extended, the relative area of land to be irrigated, compared to the water supply available for irrigation, becomes greater, and a competition for the limited water supply results, which often develops into controversy over the right of use of the water.

In a strict sense a water right does not imply ownership of the water in the same way as does a deed to a tract of land or a certificate of title to an automobile. A water right implies only the right to divert and use the water. Water when stored in a reservoir, however, is recognized as real property which may be sold or disposed of as desired by the owner. The ownership of the water of our rivers and streams rests in the State and the rules under which the State grants to the individual the right to use these waters are known as Water Right Laws.

The early settlers in Montana took up land under the provisions of the Homestead Law of 1862 and the Desert Land Act of 1877. The former Act gave 160 acres of land to anyone who settled on it and put it into cultivation. The latter deeded 640 acres of land to anyone who would irrigate it and pay the government $1.25 per acre. In 1890, filings under the Desert Land Act were reduced to 320 acres. The construction of ditches on desert claims was in compliance for title to land rather than for irrigation, and little attention was paid to the water supply available.[2] Consequently, miles of ditches were dug in Montana through which little or no water ever flowed. This is especially true in the drier parts of the state, where the diversions were made from intermittent streams.

In the more fertile mountain valleys irrigation was given more importance than in the plains country. Live streams provided a dependable source of water supply and the ditches

which tapped them were designed to actually carry water, not merely to comply with a legal requirement to obtain title to a piece of land. Thus, the right to diversion and use of water for irrigation became as important as the acquisition of title to the land.

But, while the government granted a patent deed as evidence of title to the land upon proof of compliance with the Homestead Laws, there was no deed, certificate of title, or other legal instrument offered as evidence of title to a water right.

Water rights refer also to uses other than those for irrigation. Thus, the perfected right to the use of water for mining, power, fish hatcheries, bird refuges, recreational purposes, municipal needs, culinary supply and sewage disposal, manufacturing or navigation—all may become valid water rights.

The first irrigators took for granted their right to use water from creeks or rivers for irrigation. They saw water going to waste and appropriated it to their needs. It was as free to them as the air they breathed. They made no official record of the game they shot for food or the fish they caught in the streams and likewise considered it unnecessary to make official record of the time, place, or the amount of water diverted for irrigation. However, time has changed these conditions and it is now necessary to record the game killed and limit the fish catch in order to perpetuate game, and stock the streams. Likewise, it is becoming more and more necessary to file a claim for water appropriated from the streams and rivers for irrigation or other uses in order to protect the rights.

When game was plentiful, no one concerned himself with the number of deer a person killed, but when game became scarce, steps were taken to prevent a few persons from taking more than their share while others had to go without. To do this it became necessary to issue licenses or permits to kill game and also to keep a record of game killed—a practice which is still followed.

Likewise, when only a few settlers diverted water for irrigation and the supply was more than enough for all, no one was concerned about the exact amount used by any one person. But as more and more settlers constructed diversion dams and ditches and tapped the rivers and streams for irrigation water, it soon became evident that there would not be enough water for all. Thus, a year with low water brought disputes over the division of the supply. The older settlers, in such cases, demanded that the later comers close down their headgates and refrain from taking water, in order that the prior appropriations might have a full supply. The later users, on the other hand, insisted that the available supply be divided among all users so that all might share alike.

Thus, progressive over-development of irrigation, together with the occurrence of seasons of water shortage, combined to bring about the enactment of Water Right Laws in the Western States where irrigation is practiced.

METHOD OF SURVEY

Data incorporated in this report were obtained by both the office and field survey method in cooperation with the irrigators on the land.

First, ownership plats were made up from the Courthouse records, after which field forms were prepared for each owner as they appeared on the plats, showing the name of the owner, aerial photograph number and farm boundary. The appropriated and decreed water rights that fall within the ownership boundary were also platted on this field form. Both the appropriated and decreed water rights were checked with the ownership and deeds in the Courthouse records to determine, if possible, the name of the present day water user. All water right information was listed on the field form and later verified by the water user in a farm-by-farm survey.

For all irrigation systems water users were asked specific information as to the source of water, present acreage irrigated, potential irrigable acreage under existing works, seeped acreage, condition of irrigation system, type of system and water supply.

The irrigated land classification followed and practiced by this survey includes the following: All land normally irrigated within a two to three year period directly from an existing gravity ditch system; irrigation above a ditch by pump and sprinkler system; sub-irrigation that occurs by ditch locations; and pumping from streams, reservoirs, wells, sloughs, and sumps either to gravity ditches or by sprinkler irrigation methods.

Potentially irrigable land classified by the survey is limited to those lands lying under existing ditches that have feasible qualifications necessary to become irrigated land. These qualifications include: water shortage; seeped areas; land under ditches in need of repair; and abandoned ditches from live streams.

The information in regard to the location of the irrigation system, presently irrigated and potentially irrigable lands under existing works, was indicated on aerial photographs, with the exact location of each shown, and the various systems distinguished by color.

The data obtained by the field survey was mapped on township maps from the aerial photographs by means of projection. In addition to the information pertaining to irrigation, all culture, drainage, section lines, etc., were mapped in order to make complete and authentic township plats for the area concerned. This information was then mapped by farm units on individual farm forms that show the farm boundary, the location and type of irrigation system, location of irrigated and potential irrigable lands under the system, present irrigated acres, potential irrigable acres under existing works, type of system, source of water, etc. After these farm unit forms were completed, a summary was made of each township, which shows the name of the water user, section, township and range, source of water, whether a user has a private irrigation system or is under a ditch company or irrigation district, acres irrigated from each source, present irrigated acres, potential irrigable acres under existing facilities, and maximum irrigable acres. The summary given in this report was tabulated from these township summaries to show the totals for the county.

After this was accomplished and a final check made, color separation maps were drawn which included from three to ten separation plates, depending on the number of colors that appear on the final township map in Part II of this report.

Section and township corner locations were obtained by the photogrammetric system, based on Government Land Office maps, county maps, plane table sheets and other sources.

So far as known this is the first survey of its kind ever to be consummated in the United States. The value of this work has been well substantiated by giving Montana its first accurate and verified information concerning its water use and resources under existing irrigation facilities. New lands to be developed by State and Federal construction agencies are not within the scope of this report. No effort has been made to analyze economic possibilities, or the problems of the irrigated projects, or to make recommendations as to their future development. The facts presented are as found at the time of completing this report and provide the items and figures from which a detailed analysis of water and land use can be made.

The historical data contained in this report can never become obsolete. If new information is added from time to time as new developments occur, the report can always be kept current and up to date.

MADISON COUNTY

HISTORY AND ORGANIZATION

The region known as Madison County was originally a part of the French and Spanish colony of Louisiana and came to the United States with the Louisiana Purchase of 1803.

Lewis and Clark were the first white men to visit this region when their expedition ascended the Jefferson River in August, 1805. The Jefferson River was used again by Captain Clark on the return journey in 1806. This river became a route of travel for fur traders during the early 1800's, while other streams in the area were neglected. The Madison area remained a part of Louisiana until 1812 when it was included in the newly organized territory of Missouri. When Missouri was admitted as a state in 1821 this region was assigned to the "Indian Country" and for many years was left to such wandering individuals as might explore the area and ascend its streams.

Although the Madison country lay outside the main path of travel, fur traders continued to follow the Jefferson River, the Catholic missionaries came to the Beaverhead region over the low passes to the south, and John Mullan skirted the Madison boundaries in his extensive travels in the area.

When Nebraska was formed in 1854 the Madison County area was placed within the limits of this new territory and later it was included in the Dakota territory in 1861.

The Territory of Idaho was created on March 3, 1863, and the first legislative assembly of Idaho divided the country which is now Montana into seven counties, one of which was named Madison. This county was not governed during the interim by the statutes of any state, a mining district being an independent republic.

Gold was first discovered on Gold Creek in the northern part of the Deer Lodge Valley in 1858 and on Grasshopper Creek near the Beaverhead Valley in 1862. Hundreds of miners rushed in to search for the prized metal, and in a short time the town of Bannack sprang up, which later became the place of assembly for the first Montana Territorial legislature in December, 1864.

In the Spring of 1863 a number of miners who had not secured good claims at Bannack planned to visit the Yellowstone in search of the gold reputed to be in that valley. James Stuart, one of the discoverers of gold in Montana and one of the most adventurous and restless men on the frontier, led the expedition. One group set out for the Deer Lodge Valley to obtain horses which they needed for the trip, with plans to meet the Stuart party at the mouth of the Beaverhead River. The two parties failed to unite, however, and the Stuart expedition was the first to reach the Yellowstone. They descended this river to the mouth of the Big Horn. Turning south up this stream they were attacked by the Crows, and fearing to return through the Crow country they made the long and tortuous trip through northern Wyoming, into Idaho, thence north to Bannack.

The second party which consisted originally of "Lew Simmons, Bill Fairweather, Barney Hughes, Tom Cover, George Orr, Mike Sweeny, Harry Rodgers, and Henry Edgar," followed

Stuart's group into the Yellowstone. Here they were intercepted by the Crows, robbed, and forced to return. Orr remained in the Deer Lodge Valley, and Simmons, who had formerly known the Crows, decided to stay with them for a time. The remaining six men reluctantly recrossed the mountains, the Gallatin Valley, and ascended the Madison River. Crossing the Tobacco Root Mountains by a favorable pass they came to a little creek grown thick with alder bushes, (near the Passamari or Ruby Valley) and encamped on the evening of May 26, 1863. Although tired and hungry, four of the men set off up the gulch to prospect while Fairweather and Edgar remained to guard camp and take care of the horses. In searching for a place to stake the horses these men were attracted by the vicinity and set to panning in hope of obtaining enough dust to have "tobacco money" when they returned to Bannack. The first pan yielded $2.40 and in three other efforts they accumulated a total of $12.50 which assured them they had made a rich find. Further panning on the 27th verified their hope, and on the 28th, they staked out claims and set out for Bannack to secure equipment. In recording in a rough way a water claim, Henry Edgar gave the name of "Alder Gulch" to the vicinity.

The men were unable to keep their discovery a secret and when they began the return journey a great many Bannack miners set out with them. Before the cavalcade reached its destination the discoverers insisted upon a formal recognition of their prior rights before they would go further. This was agreed to and the whole party moved up the gulch to the place where the gold was found, which they reached on June 6, 1863.

The first camp was named Varina for the wife of Jefferson Davis, but owing to the objections of Judge G. G. Bissell who refused to use the word in a legal document, the name was changed to Virginia City, and this name the community retains today. It was not long until the whole gulch was filled with miners, cabins, and claims. Nevada City, Circle City, and Central City sprang up, and probably 6,000 miners were there by the end of 1863. If a stranger entered the Gulch in the prosperous days of 1863 and 1864 and traveled from Junction to Summit, the brilliant lights illuminating the road and trail would dazzle his eyes and cause him to imagine he was in a vast city.

The process of law and order started in Alder Gulch with the staking of claims by the discoverers of the bar. On June 6, 1863, the day of arrival, the entire gulch was a scene of high confusion as everyone attempted to stake out the most advantageous claim possible. The following day a short meeting was held and a committee of five named to draft a regulation for government. On June 9th a second meeting adopted the report and the framework was set up. The district was named Fairweather. The officers were to be a president who was to preside at all meetings, and might preside at trials in cases of appeal from miners court. Second of importance was the recorder who made record of all claims and kept minutes of the district meetings and court decrees. Others included a judge to take charge of all trials, and a sheriff. The ordinary term of office was for six months. Various rules were laid down to insure orderly conduct of the work at hand.

Since the new Territory of Idaho did not furnish protection for its eastern counties, criminals and roughs of all sorts flocked to Alder Gulch and Bannack. There was no effective government in Madison County during 1863, and the sheriff at Bannack claimed the authority of law enforcement. That sheriff was Henry Plummer, a man of attractive personality and pleasing manner, but a highwayman, ruffian and murderer. Plummer had organized a large gang

of criminals known as "road agents" to plunder stage coaches and cabins, and to kill all who resisted. The principal victims were miners who had accumulated some gold dust and the express which carried the gold out of the country.

For a time the miners in Grasshopper Creek and in Alder Gulch were terrorized and did not dare protect each other against the outrages of the road agents. In 1864, however, a peculiarly atrocious crime aroused them to united action with the murder of Nicholas Tiebalt, a young man of Alder Gulch. Suspicion pointed to George Ives, a member of the road agents. After a rigorous prosecution by Wilber F. Sanders, and in spite of threats from the road agents, Ives was convicted and hanged. The movement to clean out the road agents was under way.

Three days after the hanging of Ives, a "Vigilance Committee" was organized by Wilber F. Sanders, Paris Pfouts, James Williams, James Fox, A. B. Davis and John S. Lott. New members flocked to join the organization but were carefully screened and sorted. The Vigilantes rode to Deer Lodge and obtained a confession from "Red" Yeager, a courier for the road agents, who revealed the names of most of his associates. Upon receipt of this information, they rode back to Bannack and hanged Henry Plummer and others of his gang. Returning to Alder Gulch they promptly hanged five more of Plummers men: Jack Gallagher, Boone Helm, Frank Parrish, Hayes Lyon, and George Lane. The execution of these men ended the reign of bandits in Alder Gulch. Also hanged was the notorious Joseph Slade, but he was not a member of the road agents.

The reign of lawlessness in eastern Idaho and the desire for a government closer to the mining camp led to a demand for a separate Territorial government, and on May 6, 1864, President Lincoln signed a bill creating the Montana Territory. The first legislature of the new Territory met at Bannack in December of that year. It recreated the counties established by the Idaho legislature including that of Madison with Virginia City as its county seat. It also established the Territorial Capital at Virginia City. In 1875 the Capital was removed to Helena but Virginia City remained the county seat of Madison county.

Activity in Madison County centered for many years in Alder Gulch and the placer mines. This gulch produced about $40,000,000 in gold during the first five years of mining. In 1864 the population of Alder Gulch was estimated at 10,000 people, of whom half lived at Virginia City.

While Alder Gulch was at one time the center of activity in Madison County, several agricultural valleys now contain the stable population and the towns which serve them are of more importance than are the old mining villages. Twin Bridges, located a few miles south of the Jefferson River, at the junction of the Big Hole and Beaverhead Rivers, serves much of the agricultural area found in the Jefferson Valley. The location of the State Orphan's Home here adds another element of stability. The Ruby Valley extends in a width which is suitable for agriculture some 30 miles south of Twin Bridges. In the upper end of this valley Sheridan serves as an agriculture trading center. Other towns in the valley are Waterloo, Silver Star, Laurin, Alder, and Virginia City. Virginia City, once the territorial capital, is still the county seat of Madison County. In 1946, Charles Bovey, a collector of old time relics, started recreating and restoring Virginia City's historic buildings as it was in the 1860's. That Bovey's efforts have been successful is evidenced in the thousands of tourists who come to visit Virginia City each summer.

The Madison Valley, located east of the narrow Tobacco Root Range which separates it from the mining camps of the Ruby, has a substantial area available for cultivation. The little town of Ennis which grew up around the homestead of William Ennis, who settled in the valley in 1863, forms its largest settlement. For many years the Madison Valley served as a granary for the mining population of Virginia City. The high elevation of the valley prevented the growth of vegetables in large quantity but grains and livestock are grown extensively. Smaller settlements which have varied through the years from sizable communities to a store and a post office include: McAllister, Jeffers, Cameron, Pony, Harrison, Norris, and Jefferson Island.

Madison County is bounded on the north by Silver Bow, Jefferson, and Gallatin Counties; on the east by Gallatin; and on the southeast corner the Idaho State line forms the boundary. To the south and west is Beaverhead County. The entire area is cut through or surrounded by several mountain ranges. On the eastern side lies the Madison Range with the main ridge of the Rockies lying to the south in Idaho and Beaverhead County. The Snow Crest, Ruby, and the McCarty ranges touch the western border. Starting near the northern border the Tobacco Root Mountains extend southward through the center of the county. Parallel with this range are two river valleys which extend across the county. The Madison River, which forms in the Yellowstone Park, flows through the entire length of the county on the eastern side of the Tobacco Roots. To the west the Ruby or Passamari River heads in the southern ranges and flows north to join the Beaverhead River about two miles south of Twin Bridges. The Beaverhead and the Big Hole Rivers enter the county from the west and form the Jefferson River two miles north of the town of Twin Bridges. These three rivers comprise the major drainage area for the northwest section of Madison County.

Madison County derives its name from the Madison River which was named by Lewis and Clark in honor of James Madison, then Secretary of State under President Thomas Jefferson. In 1950, the county had a population of 5,998, ranking it 34th among the counties in Montana. In size the county ranks 13th, having an area of 3,530 square miles.

TRANSPORTATION

Madison County today, as in the early days of its existence, still lies outside the main east-west routes of travel across the state, although its transportation facilities are generally good and adequate for present needs.

The main line of the Northern Pacific Railway borders the county on the north along the Jefferson River from Whitehall to Sappington Junction. From Whitehall a branch line of the Northern Pacific Railway serves the western half of the county's agricultural area passing through the towns of Waterloo, Silver Star, Twin Bridges, and Sheridan, traveling as far south as Alder. A second branch line serves the eastern part of the county from Sappington Junction to Norris. Two daily schedules of the Northern Pacific motor transport provides much needed passenger and freight service to the out-lying towns in the county. Both schedules originate and return to Butte, one schedule serves the towns in the western half of the county, namely, Twin Bridges, Sheridan, and Virginia City; while the other route travels the eastern half through the towns of Harrison, Pony, Norris, and Ennis.

The main line of the Chicago, Milwaukee, St. Paul and Pacific Railroad also parallels the Northern Pacific Railway at the northern end of the county, thereby providing additional rail-

road facilities to residents in that area. On the western side, south of Melrose, a branch line of the Union Pacific Railroad enters the county for a short distance on its way north from Dillon to Butte.

Several state highways and many improved county roads traverse Madison County providing excellent motor transport facilities. From U. S. Highway No. 10, which borders the county on the north, State Highway 41 starts at Cactus Junction entering the county a few miles north of Waterloo and follows a southwesterly direction through Twin Bridges, ending at the town of Dillon. State Highway No. 1 begins at Sappington Junction on U. S. Highway 10 and follows a southerly and easterly route through Madison County, passing through the towns of Harrison, Norris, and Ennis connecting with State Highway 191 at Duck Creek Junction which is a route to Yellowstone National Park, and goes south into Idaho. Beginning at Twin Bridges, another well traveled State Highway, No. 34, traverses in a south and easterly direction through Sheridan and Virginia City to its junction with State Highway No. 1 at Ennis. On the extreme western boundary U. S. Highway 91 enters the county South of Melrose following the Union Pacific Railroad to Dillon and points south. Most important of the improved paved county roads are located from Whitehall to a junction with State Highway 41 about 4¼ miles north of Silver Star. Another all-weather paved county road begins at Norris and extends west to the Gallatin County line.

Three local airports are maintained within the county, at Twin Bridges, Sheridan and Ennis. The nearest commercial airline facilities are located at Butte and Belgrade, 50 or 60 miles distant.

CLIMATE

Madison County is very mountainous with two important large valleys, the Madison and the Ruby. Because the population is largely confined to the valleys, long period weather records are not available for much of the mountain area. In the valleys precipitation reaches a peak in May and June with a minor second peak in September. The driest months of the year are from November through February. Precipitation is the heaviest on the western or windward, slope of the mountains. At Ennis, in the center of the Madison Valley, the annual average precipitation is 11.14 inches, but at the Norris Madison Powerhouse, which is 10 miles NNE in the foothills of the Madison Range, the average annual precipitation is 17.46 inches. At Virginia City, which is 10 miles west southwest of Ennis, and on the western slope of the Jefferson Range, the annual average precipitation is 13.92 inches. In the mountains winter snow is heavy and does not melt off until late spring or early summer.

During the spring months skies are often cloudy, and there are frequent periods of showers or general rains. During the summer and fall months there are long periods of clear sunny weather interrupted only by short periods of showers (very seldom by general rains in July and August). The growing season is short with an average of only 101 days at Ennis, 111 days at Virginia City, and 137 days at the Norris Madison Powerhouse. Generally freezing temperatures have occurred as late in the spring as mid-June, and as early in the fall as the first week of September.

Outbreaks of cold Arctic air during the winter months sometimes bring below zero temperatures for several days at a time. Blowing snow and blizzard-like conditions sometimes accom-

pany these cold outbreaks, but are not of long duration. Thunderstorms can be expected during the summer months. Severe storms, such as violent thunderstorms, tornadoes, and windstorms, are rarely experienced.

Stations with long weather records are located at Ennis, Norris Madison Powerhouse, and Virginia City. Data for these stations are listed below.

Station	Years Record	Normal Annual Temp.	Highest	Lowest	Normal Annual Precip.	Wettest Year	Driest Year
Ennis	35	42.7	100	-43	11.14	18.19(1925)	7.59(1935)
Norris Madison Powerhouse	46	46.1	102	-36	17.46	24.05(1909)	11.67(1919)
Virginia City	49	41.9	103	-43	13.92	22.14(1880)	7.08(1889)
Conway's Ranch*	17	33.9	88	-48	16.80	22.64(1938)	12.43(1931)

*Records were kept at Conway's Ranch, 26 miles SSE of the Alder Post Office, elevation 7300 feet, for the period beginning in August 1925, and ending October 1942. The precipitation record shows some of the characteristics of a mountain station. Recording rain gages are in operation at Alder, Cameron, and Silver Star. There was a full climatological station at Twin Bridges from 1899 to 1907, but it was closed until 1950, then reopened with a standard rain gage.

SOILS

Madison County is in southwestern Montana within the Rocky Mountain Physiographic Province. As is usual in mountainous areas, it has a wide variety of soils of sharply contrasting characteristics. Soil surveys of scattered ranches and exploratory traverses have shown that a majority of the great soil groups occurring in Montana are represented. Zonal great soil groups which have been observed include Sierozem (light brown), Brown (brown), Chestnut (dark brown), Chernozem (black calcareous) and Prairie (black acid) in the grasslands, and Gray Wooded, Brown Podzolic and Podzol in the forests. Associated with these are many of the various azonal and intrazonal soils.

Most of the farm lands of the county are in Madison Valley, Ruby-Jefferson Valleys and the rolling uplands in the vicinity of Harrison and Pony. Each of these constitutes distinct areas separated by rugged mountain ranges or rolling high divides.

The Madison Valley is an elongated inter-mountain basin extending southward from Lake Ennis for about 50 miles and averaging 4 to 12 miles in width. Soils on the floodplains of Madison River and its tributaries are mostly imperfectly to poorly drained young alluvials with dark surfaces high in organic matter, and gray or mottled subsoils. The very wet areas may have surface horizons of peat or muck. These soils are used mostly for the production of native hay and pasture for which they are well suited. Limited areas, which rise above the general floodplain level, are well drained. They are used for general farming. Soils on the extensive series of nearly level benches rising on either side of the river from Wolf Creek North are predominantly weakly to strongly developed Brown soils. They characteristically have grayish-brown surface soils 3 to 6 inches thick which change clearly into brown, weakly to strongly blocky subsoils. White lime carbonate horizons begin at 9 to 12 inches. Surface textures are mostly sandy loams, loams, gravelly sandy loams and gravelly loams. Depths over loose gravel vary from less than 20 to more than 60 inches. Where irrigated, areas of these soils

deeper than 20 inches over gravel are well suited to the production of alfalfa and small grains. The foot-slopes on either side of the valley are gently to moderately sloping and blend with the highest terrace level. They are coalescing alluvial fans underlaid by gravels and fine earths washed from the adjacent mountains. A small area of hilly glacial till exists south of the mouth of Indian Creek Canyon. Soils are predominantly moderately deep Chestnuts with dark grayish brown surfaces 4 to 7 inches thick which change clearly to brown subsoils with blocky structure. The depth to lime carbonate horizons varies from 10 to 18 inches. Black soils may occur locally at the upper edges of the fans. Surface textures are dominantly sandy loams and loams; but clay loams occur, especially where the bedrock in the adjacent mountains is shale. Many areas are gravelly and some are stony. Where irrigated they are used for the production of alfalfa and mixed hays. Small grain production is of limited importance. Above Wolf Creek (south) the Madison River floodplain is very narrow with little agricultural land. Soils on the extensive terraces are mostly shallow and gravelly. Rolling glacial moraines occur in many places. The soils are Chestnuts, Chernozems and Podzolics. The latter are developed under forest and have light colored acid surfaces.

The Jefferson and Ruby rivers have extensive floodplains with imperfectly to poorly drained alluvial soils. The surfaces are generally dark and high in organic matter and the subsoils are gray or mottled. There are sizeable areas of saline soils, especially along the Jefferson. Depths to gravel vary from shallow to deep with moderate depth predominating. The principal uses are for the production of mixed hay and pasture. The better drained areas are used for alfalfa and small grains. The benches on either side of the floodplains are gently to strongly sloping. Viewed in panorama they have the appearance of gigantic footslopes to the adjacent mountains. Distinct terrace levels like those along the Madison are absent. In the upper Ruby Valley the benches are dissected by creeks and rolling to hilly. Soils are Sierozems, Browns and some Chestnuts on the highest parts of the slopes. Soils in the latter two groups are similar to those described in the Madison Valley. Sierozems have light brownish-gray surfaces only 2 or 3 inches thick and brown, blocky subsoils of about the same thickness. The soils are calcareous from the surface and lime carbonate horizons begin at 6 to 8 inches. Although variable, soils on the benches of the Jefferson and Ruby valleys are chiefly moderately deep and deep over gravel and, where sufficient water can be supplied, are productive.

The Harrison-Pony-Jefferson island area in the northwest part of the county is a complex one of rolling uplands and bench remnants. In many places there is a silty mantle of wind deposits. Belts of Brown, Chestnut and Chernozem soils occur. Imperfectly to poorly drained alluvial soils occur along such creeks as Pony and Antelope.

Soils in the mountainous areas are developed from a variety of rocks including granite, gneiss, basic intrusives, schist, quartzite, limestone, shale and others. They are mostly shallow and stony but may be quite deep in places. Both grassland and forest types occur.

CROPS AND LIVESTOCK

Agriculture in Madison County, as in many other counties in Montana, is the most important and principal source of income. The county has a total land area of 2,259,200 acres, of which about 51% is mountainous and included in natural forests. Of this total land area 48.9% is in farms. There are approximately 112,000 acres of agricultural land under irrigation and 33,500 acres of non-irrigated crop land.

The principal crops grown in the county in order of their importance are: hay crops 100,000 acres, spring wheat 10,500 acres, winter wheat 9,000 acres, barley 6,000 acres, and oats 3,000 acres. A few large acreages of potatoes are grown commercially in the Jefferson Valley near Silver Star.

The main agricultural income within the county is derived from livestock. In 1953 the county assessor's office listed 45,494 head of beef cattle, 68,147 sheep, and 1,500 head of dairy cattle. Some swine are also raised but not on too large a scale.

Several well known herds of pure-bred Hereford and Angus cattle are raised in Madison County. These herds have a reputation which is well established in the state and are well known to many outside Montana.

Small farm flocks of sheep play an increasingly important part in the economy of the county. The wool produced is noted for its relatively light shrink, the cause of which is attributed to ideal range conditions in the high mountain meadows. Approximately half of the farm flock wool is marketed through the Madison-Jefferson Sheep Association. Columbia, Hampshire, and Targhee are the most popular breeds of sheep in the farm flocks.

WATER SUPPLY

The drainage area of Madison County consists entirely of streams that are the headwaters and tributaries of the Missouri River. Surrounding the county and within its borders are many mountain ranges which form two main river valleys on the eastern and western side of the county. Between the mountains and along the northern border are smaller valleys which contain a considerable amount of fertile farm land. From these snow capped mountains numerous streams rise to supply a continuous flow of water for irrigation in the valleys below.

Beginning from north to south along the western part of Madison County are the mountain ranges of the McCarty, Ruby, and Snow Crest Mountains. Through the central area, starting at the northern boundary is the Jefferson or Tobacco Root Mountain range. Continuing through the center of the county the Tobacco Root Mountains connect with Gravelly Range at the southern end. Along the eastern boundary the Madison Range extends the entire length of the county, completing the encirclement of Madison County.

Jefferson River:

The Jefferson River is formed within Madison County at the confluence of the Big Hole and Beaverhead Rivers, just north of the town of Twin Bridges. A considerable amount of land is irrigated in the upper Jefferson Valley in the north and northwestern parts of the county by direct diversions from the river itself. Below Twin Bridges the Parrot and Creeklyn ditches divert water for irrigation of a large acreage on both sides of the river, causing some shortage of water in that river area during the latter part of the irrigation season. In addition to the Parrot and Creeklyn ditches, several private ditches tap the river below the Parrot and Creeklyn headgates.

Beaverhead River:

The Beaverhead River enters Madison County on the west border, coming from a southwesterly direction from Beaverhead County, crossing the border in the vicinity of the "Point

of Rocks," approximately thirteen and one-half miles west-south-west of the town of Sheridan. The main tributary within Madison County is the Ruby River, however, two smaller tributaries have been adjudicated, those being Spring Creek and Trout Creek.

Water flowing in the Beaverhead River, was adjudicated in 1907 by Beaverhead County, some participants within the case being in Madison County. The Co-op Ditch Company owns some of this decreed water, others in the county carrying decreed rights are the New Island, Mule Shoe, Jones, and Baker Ditches. Other appropriated water is carried in private ditches. A movement is at present under way to either re-adjudicate the Beaverhead, or to clarify the present decree.

Ruby River:

The Ruby River is formed by drainages from the Snow Crest, Gravelly, and Green Horn Ranges of mountains in the southern portion of Madison County. It flows in a northerly direction to the Beaverhead River. This stream is the source of water for the Ruby River Storage Reservoir, a State Water Conservation Board project, which makes it possible to supplement the irrigation of a large area of land, in addition to placing water on otherwise dry land. The Vigilante Canal on the east side of the Ruby River and the West Bench Canal on the west side are supplied from the reservoir. Supplemental water is also taken from the stream channel itself through private and mutual use ditches.

An adjudication suit is now pending to decree the Ruby River and its tributary waters. The Ruby River was previously decreed, however, the tributary streams were excluded, making the present case necessary. This survey has disclosed that rights remain from former decrees on tributary streams that have not been recognized by the court in the present pending adjudication. This disclosure has been made evident through the fact that ditch riders find it necessary to administer the water of these tributary streams according to the former decrees for lack of information in the present form of the Ruby River decree. Streams tributary to the Ruby River that have previously been decreed are Alder Creek, Arastra Creek, Bivens Creek, California Creek (tributary to Harris Creek), a Certain Spring (tributary to Wisconsin Creek), West Fork of Granite Creek (tributary to Granite Creek), Greenhorn Creek, Indian Creek, Little Sage Creek, Mill Creek, Spring Park Hollow (tributary to Indian Creek), Williams Creek, Wisconsin Creek, Leonard Slough, and Ramshorn Creek.

Big Hole River:

The Big Hole River, like the Beaverhead River, rises in Beaverhead County. The Big Hole River forms a portion of the boundary line between Madison and Beaverhead Counties along the Madison County west border. Camp Creek, a tributary of the Big Hole River, forms the Madison County northwest boundary, separating it from Silver Bow County.

In the vicinity of Twin Bridges, irrigating water is taken from the various sloughs and channels of the Big Hole River. The principal diversions from this river are the Big Hole Co-op Ditch and the Pageville Canal. The Big Hole Co-op also is known as the "Owsley Slough." A headgate has been constructed at the intake end to regulate the slough flow, and the users' ditches then are taken directly from the slough. All irrigating water is appropriated and no adjudication suit has arisen over the waters.

There are no tributaries of any consequence to the Big Hole River in Madison County except Camp Creek, as noted above. Camp Creek has been adjudicated, with the decreed rights used in both Madison and Silver Bow counties.

Scuth Boulder River:

The entire course of the South Boulder River is within Madison County, starting in the Deer Lodge National Forest, from drainages of the Tobacco Root Mountains, flowing in a northeasterly direction to the Jefferson River. The South Boulder River was adjudicated May 22, 1920, including tributaries: Dry Creek, Morris Gulch, McGovern Creek, Spring Creek, Uncle Ben Creek, and Warm Springs Creek. The water is very much in demand, being the only dependable source through the area of its course. The supply is deemed adequate for normal years, however, in the Findings of Fact of the suit, note was taken that some years the users demanded more water than was available. Therefore, in the Conclusions of Law, a stipulation was made that cuts all rights of use in half, beginning the 20th of July annually. If after all users have been cut in half and sufficient water is not available, the later date users are then cut off in order of latest date of priority.

Willow Creek:

Willow Creek is formed by the confluence of North Willow and South Willow Creeks, both of which originate in the Tobacco Root Mountains. A dam was constructed on Willow Creek a few miles east of the town of Harrison by the State Water Conservation Board, creating the Willow Creek Reservoir, sometimes called Harrison Lake. Into one arm of this reservoir flows Norwegian Creek. Under the Willow Creek Water Users' Association the water is distributed to users in both Madison and Gallatin Counties as a supplemental supply for irrigation. The users are distributed approximately half and half between the two counties. The stream finally flows into the Jefferson River near the town of Willow Creek in Gallatin County.

Madison River:

In Yellowstone National Park, the Gibbons and Fire Hole Rivers flow together forming the Madison River, which flows westward through the southern tip of Gallatin County, then north through nearly the length of Madison County, and back into Gallatin County to meet the Jefferson and Gallatin Rivers to form the head of the Missouri River. Throughout this course it has eroded the valley between the Madison, Gravelly and Tobacco Root Ranges of Mountains. The river is dammed near the town of Ennis forming Ennis or Meadow Lake, for the purpose of power generation.

The Madison River has not been adjudicated, however, twenty-nine of its tributary streams have been. The principal incorporated ditches from the Madison River are the West Madison Canal Company, and the Indian Creek Ditch and Irrigating Company. The O'Dell Ditch, which operates under a mutual agreement, is the largest of the private ditches. Numerous other small private and mutual use ditches take water from the main channel, side channels, sloughs, and tributaries of the Madison River.

West Gallatin River:

A number of the West Gallatin River tributaries have their origin in Madison County as part of the drainage of the east slope of the Madison Range of mountains. Of these, there are only two streams, Spanish Creek and Camp Creek, which furnish water for irrigation rights. From Spanish Creek the Irvine Company uses water in both Madison and Gallatin Counties. Camp Creek rises in Madison County, however, all the irrigating rights are in Gallatin County.

Summary:

Of the Madison County water sources for irrigation, the Madison and Big Hole Rivers are stable sources of irrigation water. The Beaverhead River has some shortage in Beaverhead

County but return flow from the ditches usually provides an adequate supply in Madison County. In the vicinity of the Parrot Ditch headgate there is at times a shortage in the Jefferson River. Areas irrigated from Willow Creek and the South Boulder River could operate more effectively if there was more water available. The Ruby River can supply only the earliest rights on a free flow basis. The storage project has definitely opened up additional land to irrigation, and has stabilized the existing rights.

There are in Madison County large areas of fertile bench land that could be extremely productive if given water. This land may possibly be irrigated some time in the future by either State or Federal aid in construction of large pumping units. At the rate of population increase in the United States the development of such projects will undoubtedly be a future necessity.

STREAM GAGING STATIONS

The United States Geological Survey carries on the work of measuring stream flows in cooperation with funds supplied by the State and several Federal agencies. The results are published yearly in book form. The last publication is for the year 1951. Data given below on maximum, minimum and average flows covers the period from the beginning of measurements through the year 1951, except in a few cases data were available through the year 1952. At stations where the average flow is not given it is because there are not at least five full years of record. The water year begins October 1 and ends September 30 of the following year. Storage reservoirs that regulate stream flows of many of the stations given below were completed on the following dates: Madison (Ennis) 1900; Lima, 1902; Hebgen, 1915; Willow Creek, 1937; Ruby, 1938. Where diversions for irrigation above the gage are shown, the acreages given are estimates and will not necessarily agree with the final results of the Water Resources Survey.

Following are equivalents useful in converting from one unit of measurement to another:

(a) In Montana, one cubic foot per second equals 40 miner's inches
(b) One acre foot is the amount of water required to cover an acre one foot deep.
(c) One cubic foot per second will nearly equal two acre feet (1.983) in 24 hours.
(d) A flow of 100 miner's inches will equal five acre feet in 24 hours.
(e) One miner's inch flowing continuously for 30 days will cover one acre 1½ feet deep.

Beaverhead River at Blaine

The gage is located on the bridge of state highway No. 41 fourteen and one half miles northeast of Dillon. The drainage area is 3630 square miles. Continuous records are available since August, 1935. The gage is a water-stage recorder. The average discharge for seventeen years, including 1952, was 405 cfs. The maximum discharge was 3130 cfs (6/12/44) and the minimum daily 7.0 cfs. (5/25/50). There is some regulation by Lima reservoir and about 115,000 acres are irrigated above the gage.

Ruby River above Warm Springs Creek

The gage is located two and one-half miles above Warm Springs Creek or twenty-four miles south of Alder. The drainage area has not been measured. Continuous records are

available since March, 1948. (No winter records after 1951). The gage is a water-stage recorder. The mamimum discharge was 1230 cfs (5/3/52) and the minimum recorded 6.8 cfs (11/5/50). There are no regulations or diversions above the gage.

Ruby River above the Reservoir

The gage is located at Puller Hot Springs one-quarter mile above Cottonwood Creek, ten miles south of Alder. The drainage area is 537 square miles. Continuous records are available since May, 1938. The gage is a water-stage recorder. The average discharge for fourteen years, including 1952, is 162 cfs. The maximum was 1230 cfs (5/21/48) and the minimum 47 cfs (8/17-18/40). There are diversions for irrigation of about 3000 acres above the gage.

Ruby River at Damsite near Alder

This gage was located 1500′ above the Ruby dam or 6 miles south of Alder. Records are available from June, 1935 to March, 1937, when the station was discontinued on account of construction of the dam. The gage was a wire gage read twice daily. The drainage area has not been measured. The maximum discharge was 1800 cfs (8/14/36) and the minimum 39 cfs (7/8-10/36). There were numerous diversions above the gage.

Ruby River near Alder

The gage is located 200′ above the county bridge, two and one-half miles south of Alder or three miles below the Ruby dam. The drainage area has not been measured. Records are available from April, 1929 to June, 1939 and July, 1946 to September, 1952. The gage is a water-stage recorder. The eleven years of full yearly reading (1929-30, 1934-38, 1946-52) shows an average discharge of 103 cfs. The maximum discharge was 1380 cfs (6/11/47) and the minimum observed 0.3 cfs (4/12/38). Flow is effected by storage in Ruby Reservoir. There are diversions for irrigation of about 4500 acres above the gage.

Ruby River at Laurin

The gage is located about 200′ below the county bridge in Laurin. Records are available from August, 1946 to September, 1952. The drainage area has not been measured. The gage is a water-stage recorder. The average discharge for a six year period of full years record is 111 cfs. The maximum flow was 980 cfs (6/11/47), and the minimum daily 16 cfs (4/1/50). The flow is regulated by the Ruby Reservoir. There are diversions above the gage for the irrigation of about 11,000 acres.

Ruby River below Ramshorn Creek

The gage is located at the county bridge three miles south of Sheridan and one-half mile below the mouth of Ramshorn Creek. The drainage area has not been measured. Records are available from August, 1946 to September, 1952. The gage is a water-stage recorder. The average discharge for a six year period, the only years of full record, was 206 cfs. The maximum discharge was 1340 cfs (6/11/47), and the minimum 52 cfs (2/21-23/52). The flow is regulated by Ruby Reservoir and diversions for irrigation of about 15,000 acres above the gage.

Ruby River near Sheridan

The gage was located on a highway bridge three miles southwest of Sheridan and four miles below Ramshorn Creek. Records are available from July, 1946 to July, 1951 when the

station was discontinued. The gage was a wire-weight read twice daily. The drainage area has not been measured. The maximum flow was 1620 cfs (6/11/47) and the minimum daily 56 cfs (6/14/49). The flow is regulated by Ruby Reservoir and water diverted to irrigate about 18,000 acres above the gage.

Ruby River near Twin Bridges

The gage is located on the county bridge one and one-quarter miles above the mouth of the river or two and one-half miles south of Twin Bridges. The drainage area is 986 square miles. Records are available from August to October, 1940; July, 1941 to June, 1943; July, 1946 to September, 1952. The gage is a water-stage recorder. The average discharge for seven years (including 1952) of full record was 236 cfs. The maximum was 1500 cfs (6/12/47) and the minimum 12 cfs (5/30/51). Flow is regulated by the Ruby Reservoir and the irrigation of approximately 28,000 acres above the gage.

Big Hole River near Melrose

The gage is located on the bridge of U. S. highway No. 91, one-eighth mile below Rock Creek and eight miles south of Melrose. The drainage area is 2470 square miles. Records are available from October 1931 to September, 1952. Records from March, 1924 to September, 1931 were taken at a site one and one-half miles up stream (1924-32 are fragmentary). The gage is a water-stage recorder. The average discharge for twenty years (1932-52) was 1131 cfs. The maximum discharge was 14,100 cfs (6/3/48) but it may have been greater June 14, 1927 when Wise River dam failed. The minimum observed was 49 cfs (8/17/31). There are diversions above the gage for irrigation of about 136,000 acres.

Jefferson River near Twin Bridges

The gage was located one-half mile upstream from Hell Canyon Creek, four miles below the confluence of the Beaverhead and Big Hole rivers. The drainage area is 7640 square miles. Records are available from August to October, 1940; and July, 1941 to June, 1943, when the station was discontinued. The gage was a wire-weight read once daily. The maximum discharge observed was 13,200 cfs (5/28/42) and the minimum observed 222 cfs (8/31/40 and 9/2/40). The flow is regulated by the Ruby and Lima reservoirs and there are many irrigation diversions above the gage.

Jefferson River near Silver Star

The gage was located on the highway bridge six miles below the confluence of the Big Hole and Beaverhead rivers. The drainage are is 7840 square miles. The gage was a wire-weight read once daily. Records are available from August, 1910 to September, 1916 and July, 1920 to September, 1939 when the station was discontinued in favor of a station at Sappington. The average discharge for seventeen years record (1920-31, 1933-39) was 1536 cfs. The maximum discharge observed was 19,800 cfs (6/15/27) and the minimum 50 cfs (9/4/37). There are many diversions above the gage and the flow is also regulated by the Ruby and Lima reservoirs.

Beall Creek near Waterloo

The gage was located six miles above the mouth of Beall Creek or four miles southeast of Waterloo. Records are available from March, 1941 to October, 1942 when the station was discontinued. The gage was a wire-weight read twice daily. The maximum flow observed was 55 cfs (6/7/42) and the minimum observed 4.6 (3/25, 26, 29/41 and 1/30, 3/11-13/42). Records are fair.

South Boulder Creek near Jefferson Island

The gage was located sixteen miles southwest of Jefferson Island and 200′ above the headworks of the Liberty-Mont. Mines Co. The drainage area is not measured. Records are available from May, 1926 to September, 1933 when the station was discontinued. A recording gage was used. The maximum discharge was 434 cfs (6/16/29) and minimum 2.0 cfs (4/12/29). There are no diversions above the gage and no regulations.

Jefferson River at Sappington

The gage is located on state highway No. 10 bridge, one mile northeast of Sappington. The drainage area is 8980 square miles. The gage is a water-stage recorder. Records are available from November, 1894 to August, 1896 (gage heights only), from September, 1896 to December, 1905 and August, 1938 to September, 1952. The average discharge for eighteen years (1896-98, 1902-04, 1938-1952) was 2214 cfs. The maximum discharge was 19,900 cfs (6/6/48) and the minimum 134 cfs (8/12/40). There are some regulations from the Ruby and Lima Reservoirs. There are diversions above the gage to irrigate about 345,000 acres.

Willow Creek near Harrison

The gage is located two and one-half miles northeast of Harrison and eleven miles upstream from the mouth of the creek. The drainage area is 88.4 square miles. The gage is a water-stage recorder and cone-type weir. Records are available from April, 1938 to September, 1952 (no winter records prior to 1947). The average discharge for six years (1946-1951) was 43.1 cfs. The maximum was 725 cfs (6/27/44) and the minimum recorded 1.6 cfs (8/30/40). There are diversions for irrigation of about 13,000 acres above the gage.

Norwegian Creek near Harrison

The gage was located three miles upstream from the mouth of the creek and four miles southeast of Harrison. The drainage area is 34.6 square miles. Records are available from April, 1938 to July, 1943, and October, 1946, to September, 1951 when the station was discontinued. There are no winter records prior to 1947. The gage was a water-stage recorder. The average discharge for five years of record (1946-51) was 7.5 cfs. The maximum recorded was 28 cfs (7/20/48) and the minimum recorded 0.8 cfs (8/3/39 and 8/15/40). There are diversions above the gage for irrigating about 1000 acres. At times water is diverted from South Willow Creek into the headwaters of Norwegian Creek for placer mining operations.

Willow Creek near Willow Creek

The gage is located at a highway bridge three miles below Willow Creek reservoir and six miles above the mouth of the creek. The drainage area is 164 square miles. Records are available from September, 1919 to December, 1932, and May, 1946 to September, 1952. There are few winter records prior to 1948. The gage is a water-stage recorder. The average flow for the seven years of full record was 54.8 cfs. The maximum discharge observed was 650 cfs (7/31/48) and the minimum daily 0.3 cfs (2/1/51). The flow is regulated by Willow Creek reservoir. About 100 acres are irrigated between the gage and reservoir.

Madison River below Hebgen Lake

The gage is located 500′ below Hebgen dam, sixteen miles northwest of Grayling and seventeen miles above West Fork. The drainage area is 904 square miles. Records are available

from October, 1938 to September, 1952. Published records are "Below Hebgen Reservoir" prior to October 1, 1950. A water-stage recorder was used prior to July 13, 1943. Since then a staff gage in stilling well has been used. The average flow for fourteen years was 947 cfs (unadjusted, or 923 adjusted). The maximum flow observed was 5980 cfs (6/3/43) and the minimum daily 5 cfs (6/11-24/48) when all gates were closed. The records are good. The flow is regulated by storage in Hebgen Lake. There are diversions for irrigation of 1100 acres above the gage.

West Fork of Madison River near Lakeview

The gage was located about thirteen miles northwest of Lakeview. Records are available from April to September, 1936. The maximum discharge observed for the six months was 254 cfs (5/5/36). At times there was no flow. A staff gage was used, read twice daily. There is one small diversion above the gage.

Madison River at Lyon

The gage was located at the highway bridge at Lyon. Records are available from August, 1928 to September, 1932 when the station was discontinued. The maximum discharge was 3360 cfs (8/13-14/29) and the minimum 255 cfs (3/24 and 26-31/30). There are no diversions above the gage but the flow is completely regulated by Hebgen reservoir.

Madison River near Cameron

The gage is located 30′ below Varney bridge, one and one-half miles below Wigwam Creek and four miles northwest of Cameron. Drainage area has not been measured. Records are available from November, 1951 to September, 1952. The gage is a water-stage recorder. Records are good. Maximum discharge for the water year (November, 1951 to September, 1952) was 6670 cfs (6/7/52) and the minimum 785 cfs (4/23/52). The minimum daily was 815 cfs (4/23/52). Records are not adjusted for storage at Hebgen. There are diversions for irrigation of about 5300 acres above the gage.

Madison River below Madison (Ennis) Lake

The gage is located 500′ below the Madison power plant, two miles below the lake, or five miles northeast of McAllister. The drainage area is 2180 square miles. Records are available: January, 1890 to June, 1893; July, 1893 to November, 1894 (gage heights only) and August to November, 1910 at a site nine miles below Hot Springs Creek (drainage area, 2280 square miles) and October, 1938 to September, 1952. Records were published as "near Red Bluff," 1890-94 as "near Norris" in 1910, and as "below Madison Reservoir," 1938-50. The gage is a water-stage recorder. The unadjusted average discharge for fourteen years (1938-52) was 1615 cfs. The maximum discharge observed was 7750 cfs (6/2-3/43) and the minimum daily 409 cfs (4/27/41). The records are good, but the flow is regulated by Hebgen and Ennis lakes. About 23,000 acres are irrigated above the gage.

Madison River near Norris

The gage was located on pier of highway bridge six miles East of Norris and about three miles above Cherry Creek. The drainage area is 2280 square miles. Records are available from January, 1890 to June, 1893 (published as "Madison River near Red Bluff") and August to No-

vember, 1910. A staff gage was used. The maximum daily flow was 6420 cfs (5/28/90) and the minimum daily 850 cfs (8/26, 28/10). There were a few small diversions above the gage. Flows were regulated by Hebgen and Madison (Ennis) reservoirs.

Madison River below Cherry Creek, near Norris

The gage was located about four miles below Red Bluff bridge and one and one-half miles below the mouth of Cherry Creek. The drainage area is 2390 square miles. Records are available from January, 1897 to November, 1905. The maximum daily discharge was 10,275 cfs (6/16/99) and a minimum daily of 800 cfs (June, 1905). There were some small diversions for irrigation above the gage. Flows were regulated by Madison (Ennis) and Hebgen reservoirs.

Madison River near Three Forks

This gage was located five miles south of Three Forks, or eight miles above the mouth of the river. The drainage area is 2485 square miles. Records are available from October, 1941 to September, 1950; September, 1893 to May, 1897 (gage heights only in 1893, 1894, 1897), and November, 1928 to September, 1932 at a site six miles downstream (discontinued). The gage was a water-stage recorder. The maximum daily discharge (1895-96, 1928-32, 1941-50) was 8175 cfs (6/19/96) and minimum observed of 416 cfs (2/27/30) regulated. The measured flow is regulated by Hebgen and Madison reservoirs. There are diversions above the gage for irrigation.

MINING

Madison County is one of the important mining counties of Montana. The important districts (with discovery dates in parentheses) are: Norris (1865), Norwegian Creek (1864), Pony (1874), Renova (1896), Rochester (late 60's), Sand Creek (1890's), Sheridan (1864), Silver Star (1867), Twin Bridges (1864), Virginia City (1863), and Washington (1864).

Accurate statistics on metal production of the county are not available as the records prior to 1904 are not complete. However, a conservative estimate indicates that since the discovery of gold at Virginia City in June, 1863, to the end of 1950, the county has produced about $96,000,000 in gold, silver, copper, lead, and zinc. By far the greater part of the value (probably over nine-tenths) was due to the production of gold, and by far the greater part of the gold came from the Virginia City (Alder Gulch) placers.

Following are some brief notes on the more important mining areas:

McCarty Mountain district

This district is in the McCarty Mountains about 12 miles west of Twin Bridges. Her veins occur in quartzites and slates cut by granite. The ores carry gold, silver, and lead. Total production is not available, but the district was active in the 1920's and 1930's when production ranged from $400 to $13,000 a year.

Norris district

This district includes the Lower Hot Springs district east of Norris and the Upper Hot Springs district west of Norris, which is the terminus of a branch line of the Northern Pacific Railroad. Lode mines in the district were discovered in the late 60's, but production has been

intermittent since 1900. The total production prior to 1930 is valued at $3,964,500—mostly in gold. The principal mines are the Boaz, Josephine, and Red Bluff in the Lower Hot Springs area, and Revenue, Bull Moose, and Galena in the Upper Hot Springs district. Ore deposits occur in veins cutting gneiss, schist, and granite.

Norwegian Creek district

This district is halfway between Pony and Norris. The placers were discovered in 1864 and the lodes soon after. The placers had yielded $150,000 in gold by 1874. A gold-dredge, built in 1932, was operated in the area intermittently. Ore deposits consist of placers and gold-bearing quartz veins. Some copper is associated with the gold ores.

Pony (Mineral Hill) district

The mines of this district lie west of the town of Pony, which is about 6 miles south of Harrison, a station on the Norris branch of the Northern Pacific Railroad. Placers were discovered in the early 70's and lode mining began in 1874. The silver veins of Potosi, about 6 miles south of Pony, were discovered in 1875. This district, together with Potosi, Mammoth and Bismark districts to the south and west, has yielded more than $6,500,000 mainly in gold but also appreciable amounts of silver, copper, and lead. The tungsten deposits of Pony and Potosi have not yet been worked commercially. The country rock is pre-Cambrian gneiss and schist cut by granite. The ore deposits occur mainly as veins cutting both the igneous and metamorphic rock. The principal mines are the Boss-Tweed-Clipper, Atlantic-Pacific, Strawberry-Keystone, Garnet, Mammoth, and Bismark.

Rochester (Rabbit) district

Rochester Basin is 10 miles northwest of Twin Bridges on the Northern Pacific Railroad and 10 miles east of Melrose on the Union Pacific Railroad. The basin lies at an elevation of about 5,300 feet and is surrounded on the west, north, and east by spurs of the Highland Mountains, and on the south by the McCarty Mountains. The district was discovered in the 1860's and has been worked intermittently since. From 1901 to 1905, the period of greatest activity, the Watseca and several other mines were active. Stamp mills, Chlorination mills, and other types of concentrators have been built here. The district has produced gold ore valued at over $2,500,000, as well as appreciable amounts of lead and silver. The gold veins are in Rochester Basin proper, and the lead-silver veins are to the south in Nez Perce drainage. The veins cut pre-Cambrian schist and gneiss. A little gold has been recovered from placers, but as a whole, placers have not been important. The important mines are the Watseca, Buffalo, Thistle, Index, Longfellow, New, Elgin, Big Bonanza, Shoemaker, Cooper, Emma, Picard, and Calusa.

Sand Creek district

This district is 2 miles south of Sappington, which is on the Northern Pacific and Chicago, Milwaukee, St. Paul, and Pacific Railroads. The mines have been active but very intermittently, and production is not important. The Chile and Whippoorwill mines are the principal properties but have long been idle. The district is of interest in that some mica of commercial grade has been mined from the Sappington pegmatite deposit, and that small amounts of fergusonite, a radioactive mineral, is associated with the mica.

Sheridan district

This district includes the once organized mining districts of Wisconsin Creek, Indian Creek, Brandon, Mill Creek, Quartz Hill, Ramshorn, and Bivens Gulch, and extends from California

Gulch 9 miles southeast of Sheridan to Wisconsin Creek, 10 miles northeast of Sheridan, the shipping point on the Ruby Valley branch of the Northern Pacific Railway. Placer gold was discovered in Ramshorn, Bivens, and California Gulches soon after the discovery of gold at Virginia City (June 1863), and within a year many gold-bearing quartz veins were located. Production figures prior to 1905 are not available, but since that time the district has produced over $10,000 in placer gold and over $600,000 in gold, silver, copper, lead and zinc from deep mines. Over a half of the value was due to gold, and lead production greatly exceeded that of copper and zinc combined. Ore deposits occur as vein fillings in gneiss and schist, and as replacements in pre-Cambrian limestone. The mines are Lakeshore (Gladstone), Leiter, Noble, Jonquil, Fairview, Red Pine, Buckeye, Toledo, Tamarack and Broadgauge, Smuggler, Sunnyside, Belle, Betsy Baker, and Agitator-Concentrator.

Silver Star district

Silver Star, one of the oldest lode mining districts in Montana, lies on the west side of Jefferson River about 16 miles southwest of Whitehall, a station on the Northern Pacific and Chicago, Milwaukee, St. Paul and Pacific railways. Many of the mines were well known in the 1860's. The Greene Campbell was opened in 1867, and 1870 its ores were treated in the Greene Campbell mill equipped with 10 stamps, 4 horn pans, and 2 settlers. The Stevens & Trivett mill, with 12 stamps, treated ore from the Iron Rod mine. The district has produced almost continuously and total production will amount to well over $2,500,000. Ore deposits occur as veins cutting pre-Cambrian gneiss and schist and as contact deposits between granite and Paleozoic sedimentary rocks. The mines are the Greene Campbell, Broadway, Victoria, Hudson, Keystone, Rhyolite, Edgerton-Eagle, Aurora, Moonlight, and Golden Rod (formerly the Iron Rod).

Twin Bridges (Tidal Wave) district

The Tidal Wave district is in the northwestern part of the Tobacco Root Range east of Twin Bridges, a station on the Ruby Valley branch of the Northern Pacific Railway. It extends from Wet Georgia Gulch on the south to Belle Canyon on the north. Although first prospected as early as 1864, it was not developed for many years. But few large scale operations requiring investment of much capital have been undertaken, and most mines have been operated on a small scale by the owners or lessees. Available production records date back only to 1904, but total production since that time is probably well over $700,000, chiefly in gold with some lead, silver, and copper. Ore deposits occur as fissure veins carrying gold, silver, copper, lead, and zinc cutting granite or gneiss; as contact deposits carrying lead and silver or copper and gold in Paleozoic limestone near its contact with the granite; and replacement ore bodies carrying lead, zinc, copper and silver in limestone near igneous sills. The mines are Bielenberg and Higgins, Smelter Mountain group, Giant, Copper King, Little Bear, Grouse, Crystal Lake, Eleanora, Sunbeam, Sunflower, High Ridge, Empire State, Alfreda, Deutchland, Corncracker, and Strawn.

Virginia City Region

Alder Gulch is at the south end of the Tobacco Root Range in the central part of Madison County. From Old Baldy Mountain to the junction of Alder Gulch and Ruby River, there were at one time seven organized mining districts, which, in order northwest are: Summit, Pine Grove, Highland, Fairweather, Brown's Gulch, Nevada, and Junction. Virginia City, the county seat of Madison County, is 8 miles southeast of Alder, the terminus of the Ruby Valley

branch of the Northern Pacific Railway. The Fairweather district was discovered in June, 1863, by William Fairweather and party. In the rush which followed, Bannack, the territorial capital, was practically abandoned, and Virginia City became the second capital of Montana. In the next four years, it is estimated that $30,000,000 in gold was taken out before the fabulous richness of the placers began to play out, and some miners began to turn their attention to the nearby lode mines. The smaller towns around Virginia City soon sank into oblivion, but Virginia City was revived somewhat by the introduction of gold dredges into Alder Gulch in 1899. Although Bannack was the scene of the first successful gold dredge in the United States, Alder Gulch can be said to be the seat of the development of modern gold dredging in the United States. Altogether 6 dredges were operated in the gulch during the period 1899 to 1923. In 1935 to 1937 and 1940 and 1941 dry land dredges were operated in Alder Gulch. Most of the mineral wealth of this district has been produced as placer gold. The total value of all metals produced from 1863 to 1930 inclusive is estimated at $54,296,081 of which placer gold accounted for $50,611,886 and lode gold for $2,164,501; the remainder being the value of 1,455,-955 ounces of silver, 50,812 pounds of copper, and 91,314 pounds of lead. Most of the ore deposits are in veins cutting pre-Cambrian gneiss and schist. The principal mines are the Easton-Pacific, Greenback, Marietta, Winnetka, Prospect, Alameda, Bamboo Chief, Wakoosta, High-Up, Dorsey, Irene, Kearsarge, Fortuna, Mt. Chief, and Mapleton. The placers extended from Ruby Valley up Alder Gulch for 15 miles.

Washington Gulch (Meadow Creek) district

This district is 15 miles southwest of Norris and includes the headwaters of North Meadow, Washington, Leonard, and South Meadow Creeks. Since 1901 the district has produced in the neighborhood of $600,000 principally in gold. Ore deposits consist of placers and veins in gneiss associated with andisitic intrusions. The principal mines are the Missouri-McKee, Last Chance, High Bluff, Frisbie, Kidd, and Paymaster.

Whitehall (Renova) district

The mines of this district lie in the foothills of the Tobacco Root Range south of Whitehall. The district was not active prior to the discovery of the Mayflower mine in 1896. Between 1896 and 1901 the Mayflower mine alone produced $1,250,000 in gold. Since 1901 the area has produced over $500,000 principally in gold. Ore deposits occur as mineralized fissures in limestone and veins cutting pre-Cambrian (Beltian) arkose and syenite porphyry which has intruded the arkose. The principal mines are the Mayflower, West Mayflower, Surprise, Gold Hill, Mary Ingaber, Colorado, and Bluebird.

SOIL CONSERVATION DISTRICTS

A Soil Conservation District is a legal subdivision of the State, established by the farm and ranch owners and operators, which permits group action in dealing with the problems in soil erosion, moisture conservation, soil fertility, and land use.

The Montana State Soil Conservation District Law was passed by the 26th General Assembly on February 28, 1939, and gives the authority for organizing Soil Conservation Districts within the State. Under provisions of the Law, no district can be formed unless the people want it, nor unless they register this want; first by petition, and later by a favorable

vote of at least 65 percent of the qualified voters in the proposed district. The law also provides for the formation of a State Soil Conservation Committee, which assists in the organzition of districts and also in securing cooperation from state and federal agencies.

The main governing body of a Soil Conservation District is the board of five supervisors who are elected by the people of the District. This board is empowered by the law to study the conservation problems of the district and to formulate programs to deal with these problems. This Board may call upon local, state and federal agencies to assist in executing the districts program, and by applying to the Board of Supervisors, farmers and ranchers may obtain such technical assistance as the District may have without expense to the operator. The use of other facilities, such as earth-moving equipment, owned, leased or contracted by the District is made available at rates fixed by the Board of Supervisors.

In the State at the present time there are 59 Soil Conservation Districts organized, and 22 Cooperative State Grazing Districts receiving technical assistance from the Soil Conservation Service in conducting conservation programs.

STATE SOIL CONSERVATION DISTRICTS IN MADISON COUNTY

Madison County is covered in its entirety by soil conservation districts, five of which lie wholly or in part within its borders.

Organized in 1944, the Three Rivers District covers parts of four counties including a few thousand acres of dryfarm land in northeastern Madison County. In 1947 the Madison District was organized, comprised of some 827,000 acres of Madison River drainage within the county. The Jefferson Valley District, organized in 1948, includes some 391,000 acres in northern Madison County. The Beaverhead District was organized in 1950 and includes several thousand acres of range land in western Madison County. Largest in the county, the Ruby Valley District, was organized in 1951; it totals some 1,024,000 acres comprised of the Ruby River watershed and lower portions of the Beaverhead and Big Hole Valleys.

All five districts have agreements with the Montana Extension Service—charged with information and education—and with the U. S. Soil Conservation Service, which is charged with the technical phases of the program. Soil Conservation Service technicians headquartered at Sheridan and Ennis serve the Ruby Valley and Madison Districts; portions of the county lying within the other three districts are served by technicians headquartered at Whitehall, Three Forks, and Dillon respectively.

Technical phases of the districts' programs include soil, forage, and topographical surveys; conservation planning with land operators; and layout work essential to establishing conservation practices on the land.

Forest and range comprise most of the acreage in the county. Acreages of irrigated land are roughly 25 thousand, 50 thousand, and 75 thousand respectively for the Jefferson Valley, Madison, and Ruby Valley Districts. Some 600 land operators are divided among these three districts in like proportion.

Basic conservation problems in the county are erosion due to slope and inadequate soil cover, plus water-logged land.

District programs emphasize better irrigation systems and methods to combat seepage and erosion losses; drainage; range management to correct widespread range depletion; grass seeding to provide spring grazing and relieve load on native ranges; stockwater development to relieve improper stock distribution; irrigation water development for stability; rotations and residue management to protect and improve cropland.

The Madison District has begun a vigorous conservation education campaign, with the public schools playing the leading role. The Ruby Valley and Jefferson Valley Districts are carrying on a variety of conservation educational activities. In 1951 there were no border irrigation systems, deep drains, or stubble mulch tillage in the Ruby Valley District. Thanks to the educational program, two and one-half years later many border systems may be seen and interest in drainage is high; the major portion of dryfarm land in the district has been placed under a stubble mulch program.

While much progress has been made, the big job remains to be done. Each year more operators realize that practically all conservation pays for itself, but it will be many years before means and time permit the districts to realize their goals.

U. S. FISH AND WILDLIFE SERVICE
FISH CULTURAL STATION, ENNIS, MONTANA

On July 20, 1931, a land transfer of 160 acres consisting of the East half of the Southwest quarter of Section 13; the Northwest quarter of the Northeast quarter of Section 24 in Township 7 South—Range 2 West, of the Montana Principal Meridian, was made from the Elling Estates Company to the United States of America. Constructed on this land was the Ennis, Montana Fish Cultural Station.

The land purchased contains Blaine Spring Creek which furnishes some 19,000 gallons of water per minute, the temperature of which is a constant 54 degrees farenheit. The Economy Power Company water right decreed in 1913 of 1340 miner's inches was transferred to the station by supplemental decree Case No. 2668 and given the priority date April 1, 1933. In addition to this right, 10 miner's inches appropriated May 1, 1881 was acquired from the right decreed to Albert Thexton in the Blaine Spring Creek decree Case No. 1185. As stipulated by the decree the water acquired for fish cultural purposes will be returned to the stream after use.

Immediately following the land purchase, construction began in 1931 on the hatchery building, a service building, a residence, and ice house. Further construction during the period of 1933-1940 included sixteen circular ponds, each 25 feet in diameter, another residence, and one access road. Funds appropriated during the years of 1950-1952 permitted the replacement of the circular ponds with eighteen concrete raceway type ponds 8 feet in width and 80 feet in length, and the construction of a new service building and two residence housing units. Also an addition was made to the main hatchery building which doubled the production capacity of the hatchery. Future development plans include the construction of twenty-two additional concrete raceway ponds and other facilities to further increase production.

Rainbow trout are the principal species of fish reared at the hatchery, with Montana Grayling second of importance. Beginning with the 1954 current year, approximately 100,000 pounds of two to ten inch fish will be reared annually for planting in Montana waters and in the Madison River drainage of the Yellowstone National Park.

BEAVERHEAD NATIONAL FOREST

That portion of Beaverhead National Forest within Madison County constitutes 605,708 acres of the total area of the county. It was set aside piecemeal as the Madison National Forest. The first reservation was made in 1892 of twelve townships on the south end of the Snow Crest and Gravelly Ranges. In 1902 the balance of the Gravelly Range and Snow Crest Mountains were set aside. In 1904 the east side of the Madison River was set aside as a part of the Gallatin Forest Reserve. This was later added to the Madison Forest Reserve. In 1905 the Tobacco Root Mountains were added as part of the Madison Forest Reserve and in 1906 the name was changed to Madison National Forest. In 1932 for economy and better administration the Madison National Forest was eliminated. The Sheridan and Madison ranger districts were added to the Beaverhead National Forest and the Ennis District was added to the Gallatin National Forest. In 1945 the Ennis District was transferred from the Gallatin National Forest to the Beaverhead National Forest with forest headquarters at Dillon, Montana.

The national forest lands in Madison County are primarily the rough, mountainous areas that are unsuited to conventional agricultural use. These areas are the west slopes of the Madison Range, the Gravelly Range, the Snow Crest Range, and the Tobacco Root Range of mountains. However, these areas contain natural resources that should be safeguarded and so administered that future generations will receive the forthcoming continuous benefits that we should be expected to pass on to them.

The most outstanding renewable resources contained in this rugged country are productive watersheds, forage for domestic livestock, wildlife, fish and game habitat, timber and recreational opportunities for thousands of people.

Foremost in lasting value and real importance in national forests are the watersheds. From this high rugged area which, if kept in good condition, is natures water reservoir and from it comes the cool, clear and clean water for domestic use, stock use, irrigation, power generation, industrial use and fish production. The development and maintenance of downstream areas is dependent upon a continued and regulated supply of suitable water. This can best be done on the watersheds at the headwaters.

The grazing of domestic livestock on national forest lands in Madison County is of major importance from the standpoint of the economics of the local communities. Both cattle and sheep graze the national forest lands under paid permits. An average number of 11,600 cattle and 50,300 sheep graze these lands annually. Sheep permits run from 60 to 80 days. Cattle permits run from 3 to 5 months. Grazing is not permitted on all areas that could be grazed and where such use would be detrimental to the watershed, this use is prohibited. Where grazing is permitted it is controlled so as not to be detrimental to the water shed. All grazing is under permit.

Wildlife populations on national forest lands in Madison County are generally on the increase. Recent wildlife population estimates, made by district forest rangers in cooperation with Montana State Fish and Game Department personnel, place game number in this area approximately as follows: Mule Deer, 9200; Elk, 2300; Black Bear, 440; Grizzley Bear, 15; Moose, 380; Antelope, 120; Big Horn Sheep, 30; and Mountain Goats, 20.

This wildlife is a renewable resource and provides sport as well as food. If the herds are kept in balance with their range and especially winter range, which is the limiting factor in this area, they remain thrifty and reproductive potential is high. However, they must be controlled or their numbers become excessive for their range and disease, death from starvation, and lowered reproductive rate enter the picture to control the herd.

Excellent fishing waters, in the form of streams and lakes, abound on the national forest lands within Madison County. Some of the best fishing in the country is to be found in this county as evidenced by the number of people from all over the country who come here to fish.

The timber resource, if compared with western Montana or northern Idaho, would be of relatively minor importance, has a high economic value in the county. While it does not furnish high grade finish lumber, it does furnish rough lumber, fence posts, fence poles and fuel for the local residents.

A large portion of the timbered area does not have commercial timber. These stands are made up of Alpine Fir, Limber Pine, White Bark Pine, and Spruce. Their main value is in watershed protection.

Trees of commercial importance are Lodgepole Pine, Douglas Fir, and Spruce. Lodgepole Pine furnishes fence posts, fence poles, and wood. It is being used in many areas for telephone poles, power poles, and pulp. Douglas Fir and Spruce are mostly used for lumber.

Timber harvesting is allowed to the limit to which cutting can be replaced by annual growth. This assures a crop for future generations to harvest. 540,000 board feet of lumber, 16,000 poles, and 10,000 posts were cut from these lands during the past year. The sale of these forest products is handled by permits.

Development and maintenance of suitable recreation facilities on national forest lands in Madison County is another responsibility which will become increasingly more important as population increases. There are 9 improved campgrounds and 19 improved picnic spots within the forest area. Users of these areas find tables, benches, grills, and sanitary facilities to make their outing on national forest lands more enjoyable. There is no charge made for this use. These improvements are maintained to the best standard possible under present financial conditions. Also, on these public lands two resorts and nine summer homes have been constructed under special use permit.

In administering this public resource on national forest lands in Madison County the Forest Service has built and maintains many miles of road, trail, and stock drive-ways. While not their primary purpose, the roads, trails, and drive-ways serve the public when for any reason the public finds it desirable to travel through the national forest.

Along with managing these resources to maintain and improve them goes the responsibility of protecting them from fire, probably their worst natural enemy. In a matter of hours a bad fire can destroy what it has taken nature hundreds of years to build. Fires can destroy extensive stands of timber that took a century to grow. They can blacken a section of grass land in a matter of minutes. They kill wildlife and ruin wildlife habitat and fishing waters for indefinite periods, depending on severity of burn. Fires mar and deface beautiful recreation areas and destroy recreational improvements, but worst of all they completely disrupt

the water-holding ability of these mountain watersheds. Instead of absorbing the spring snow melt, or the spring and summer rain, and holding it for gradual and continuous release of clean, clear water, they produce a sudden rushing silt laden body of water which results in overwhelming, devastating and costly floods followed by long dry periods.

Each of the three ranger districts within Madison County maintain well trained detection and suppression force during fire season for initial attack and suppression of smaller fires. They also rely on trained local cooperators for a lot of detection and suppression action. If fires get too big for the local organization outside sources are relied upon for further help.

In the administration and management of the national forest lands within Madison County several thousand dollars are collected annually from timber sales, grazing permits, and special use permits.

These receipts are paid into the Treasury of the United States. The amount collected from National Forest land in each county is kept track of and once a year the Federal Government pays each state an amount equal to 25% of national forest receipts collected in that state. This, in turn, is passed down to the county by the state, so in the end the county gets 25% of all national forest receipts collected within that county which is available for school funds and road funds within the county.

The overall aim is to attain integrated multiple use of all forest resources on a sustained yield basis for the greatest good to the greatest number for the longest period of time.

SUMMARY OF IRRIGATED LAND BY RIVER BASINS IN THE FOLLOWING COUNTIES COMPLETED TO DATE

Big Horn, Carbon, Custer, Gallatin, Golden Valley, Madison, Meagher, Musselshell, Park, Rosebud, Stillwater, Sweet Grass, Treasure, Wheatland, and Yellowstone

RIVER BASIN	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Missouri River Drainage Basin			
***Missouri River**	4,126	1,512	5,638
Jefferson River	17,661	3,650	21,311
Beaverhead River	7,367	1,815	9,182
Ruby River	33,404	4,261	37,665
Big Hole River	10,587	234	10,821
South Boulder	5,893	695	6,588
Willow Creek	11,181	2,043	13,224
Madison River	39,445	7,660	47,105
Gallatin River	2,734	1,126	3,860
West Gallatin River	85,107	9,488	94,595
East Gallatin River	24,073	10,483	34,556
Smith River	30,304	18,398	48,702
Musselshell River	64,789	57,870	122,659
Grand Total Missouri River	336,671	119,235	455,906
Yellowstone River Drainage Basin			
Yellowstone River	223,406	52,550	275,956
Shields River	33,260	8,556	41,816
Big Timber Creek	10,378	9,234	19,612
Boulder River	13,415	2,742	16,157
Sweet Grass Creek	18,594	23,006	41,600
Stillwater River	11,661	3,459	15,120
Rosebud River	15,828	12,944	28,772
Clarks Fork River	33,286	7,328	40,614
Rock Creek	58,482	16,867	75,349
Big Horn River	48,261	15,735	63,996
Little Big Horn River	17,134	9,844	26,978
Tongue River	22,137	7,479	29,616
Powder River	8,264	1,804	10,068
Grand Total Yellowstone River Basin	514,106	171,548	685,654
Grand Total in the Counties Completed to Date	850,777	290,783	1,141,560

It was necessary to cover 16,288,675 gross acres in the above basins in order to complete the survey.

*Names of streams indented on the lefthand margin indicate that they are tributaries of the first stream named above which is not indented.

IRRIGATION SUMMARY OF MADISON COUNTY BY RIVER BASINS

REGULAR IRRIGATION—Missouri River Basin

	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
*Missouri River	0	0	0
Jefferson River	8,456	580	9,036
Beaverhead River	6,071	1,059	7,130
Stone Creek	151	136	287
Warm Springs	147	0	147
Spring Creek	306	0	306
California Slough	237	270	507
Ruby River	15,982	1,459	17,441
Lazyman Creek	33	0	33
Warm Spring Creek	216	0	216
Willow Creek	118	0	118
Ledford Creek	575	112	687
Spring Creek	64	0	64
Greenhorn Creek	544	0	544
Robb Creek	457	398	855
Sweetwater Creek	0	0	0
Winsett Creek	56	30	86
Cottonwood Creek	19	0	19
Hinch Creek	14	5	19
Alder Gulch Creek	856	22	878
Daylight Gulch	6	0	6
Brown's Gulch	64	0	64
Granite Creek	110	0	110
Slough	21	0	21
California Creek	236	53	289
Bivins Creek	38	0	38
Clear Creek	1,377	42	1,419
Silver Spring	237	0	237
Ramshorn Creek	682	0	682
Cole Spring	143	0	143
Horse Creek	5	0	5
Mill Creek	4,638	488	5,126
Forest Station Spring	2	0	2
Baker Springs	17	0	17
Unnamed Spring	4	0	4
Indian Creek	2,982	77	3,059
South Fork Indian Creek	5	0	5
Wisconsin Creek	2,449	239	2,688
Nugget Gulch	107	0	107
Unnamed Springs	93	0	93
Sump	0	8	8

*Names of streams indented on the lefthand margin indicate that they are tributaries of the first stream named above which is not indented.

IRRIGATION SUMMARY OF MADISON COUNTY BY RIVER BASINS

REGULAR IRRIGATION—Missouri River Basin

(Jefferson River)—Continued	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Leonard Slough	532	37	569
Jacobs Slough	50	0	50
Unnamed Spring	66	187	253
Swamp	15	0	15
Swamp	108	80	188
Big Hole River	10,045	234	10,279
Stevens Slough	43	0	43
Camp Creek	463	0	463
Unnamed Slough	18	0	18
Bear Gulch or Creek	392	202	594
Hell Canyon Creek	22	0	22
Unnamed Spring	0	16	16
Dry Boulder Creek	617	12	629
Cherry Creek	100	0	100
Spring Reaf Creek	33	0	33
Sump	137	20	157
Parson Slough	211	135	346
Spring Creek	0	0	0
Beall Creek	409	155	564
Wickham Creek	113	0	113
Mill Canyon Creek	170	0	170
Dry Creek	21	21	42
Fish Creek	85	0	85
Mayflower or Cedar Hollow Gulch or Creek	25	25	50
South Boulder Creek	5,721	665	6,386
Morris Gulch	46	20	66
Sams Gulch	42	0	42
Brownback Gulch	15	0	15
Unnamed Creek	0	10	10
Warm Springs Creek	8	0	8
Antelope Creek	42	0	42
Willow Creek	494	0	494
Dry Hollow Creek	162	0	162
Sand Hollow Creek	15	0	15
Norwegian Creek	212	182	394
North Willow Creek	4,006	695	4,701
South Willow Creek	5,987	1,019	7,006
Camp Creek	158	89	247
Madison River	4,451	250	4,701
Sheep Creek	174	0	174
Mile Creek	72	0	72
Keller Spring	5	0	5
Snow Creek	16	0	16

IRRIGATION SUMMARY OF MADISON COUNTY BY RIVER BASINS

REGULAR IRRIGATION—Missouri River Basin

(Madison River)—Continued	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Trout Creek	17	0	17
Sage Creek	17	0	17
Deadmans Creek	0	0	0
Pine Butte Creek	25	0	25
Curlew or Cascade Creek	9	0	9
Papoose Creek	282	0	282
Squaw Creek	258	0	258
Quaking Asp Creek	52	0	52
Cottonwood Creek	94	0	94
Moose Creek	196	0	196
Wall Creek	228	0	228
Wolf Creek	885	220	1,105
Trail or Horse Creek	603	0	603
Ruby Creek	591	127	718
Corral Creek	40	0	40
Spring Creek	15	0	15
Indian Creek	1,811	1,225	3,036
South Indian Creek	136	324	460
Wigwam Creek	671	53	724
Warm Spring or Blaine Spring Creek	1,139	0	1,139
Swamp	466	0	466
O'Dell Creek	1,976	311	2,287
Bear Creek	1,468	319	1,787
North Fork Bear Creek	951	0	951
Mill Creek (A Short Creek)	155	35	190
Tolman Creek	74	0	74
Shell Creek	139	68	207
Cedar Creek	3,127	683	3,810
Jack Creek	2,095	734	2,829
Unnamed Springs	24	0	24
Jordan or Jourdain Creek	699	0	699
Crooked Creek	0	87	87
Short Creek	0	19	19
St. Joe Creek	101	73	174
Moores Creek	109	0	109
Meadow Creek	0	0	0
North Meadow Creek	2,544	12	2,556
Washington Creek	199	0	199
Parker Creek	20	0	20
South Meadow Creek	1,644	55	1,699
Leonard Creek	85	0	85
Cold Spring Creek	20	0	20
Hot Spring Creek	316	0	316

IRRIGATION SUMMARY OF MADISON COUNTY BY RIVER BASINS

REGULAR IRRIGATION—Missouri River Basin

(Madison River)—Continued	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Bradley or Burnt Creek	275	58	333
Woods Creek	72	0	72
Crowley Spring	2	0	2
Boaz Gulch or Creek	0	66	66
Cherry Creek	1,451	318	1,769
Mud Creek	89	0	89
Carpenter Creek	43	67	110
McRoberts Creek	33	0	33
Mill Creek	0	22	22
Deep Creek	34	0	34
Pole Creek	138	0	138
Gallatin River	0	0	0
West Gallatin River	0	0	0
Spanish Creek	0	0	0
North Fork Spanish Creek	533	25	558
Cuff Creek	36	0	36
Grand Total Regular Irrigation	108,806	13,933	122,739

FLOOD IRRIGATION—Missouri River Basin

Missouri River	0	0	0
Jefferson River	0	0	0
Beaverhead River	0	0	0
Spring Creek	10	0	10
McHessor Creek	206	83	289
Ruby River	33	13	46
Cream Creek	15	0	15
Sweetwater Creek	66	763	829
Little Sage or Little Spring Creek	0	0	0
Sheep Spring	9	0	9
Idaho Creek	30	85	115
Williams Creek	36	0	36
Alder Gulch Creek	26	0	26
Granite Creek	0	12	12
Clear Creek	12	0	12
Ramshorn Creek	10	0	10
Mill Creek	253	0	253
Nonpareil Creek	0	0	0
Park Spring	4	0	4
Indian Creek	85	43	128
Wisconsin Creek	143	375	518
Big Hole River	0	0	0

IRRIGATION SUMMARY OF MADISON COUNTY BY RIVER BASINS

FLOOD IRRIGATION—Missouri River Basin

(Jefferson River)—Continued	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Camp Creek	18	0	18
Goodrich Gulch or Creek	35	0	35
Unnamed Springs	53	16	69
Bear Gulch or Creek	0	0	0
Unnamed Creek	54	0	54
Hell Canyon Creek	8	0	8
Coal Creek	23	0	23
Cherry Creek	207	15	222
Mud Spring	0	60	60
South Boulder Creek	0	0	0
Morris Gulch	61	0	61
Antelope Creek	130	27	157
Reed Creek	26	0	26
Wash Creek	97	0	97
Wetzel Gulch	0	82	82
Dry Antelope Creek	68	84	152
Dry Lake Gulch Creek	0	10	10
Willow Creek	0	0	0
North Willow Creek	85	0	85
Cataract Creek	12	0	12
Magpie Creek	10	44	54
South Willow Creek	0	0	0
Unnamed Spring	5	0	5
Beckwith Creek	0	14	14
Boyer Creek	35	0	35
Madison River	0	0	0
English George Creek	65	0	65
Hyde Creek	63	0	63
Nickerson Creek	0	0	0
Curley Bill Creek	0	10	10
Ruby Creek	30	0	30
Indian Creek	45	14	59
Warm Spring or Blaine Spring Creek	0	0	0
Moran Creek	70	0	70
Eight Mile Creek	5	30	35
O'Dell Creek	0	0	0
Bear Creek	188	14	202
Mill Creek (A Short Creek)	225	67	292
Tolman Creek	185	80	265
Cedar Creek	6	25	31
McDeed Creek	0	65	65
Jack Creek	206	617	823
Moores Creek	137	0	137

IRRIGATION SUMMARY OF MADISON COUNTY BY RIVER BASINS

FLOOD IRRIGATION—Missouri River Basin (Madison River)—Continued	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Postlewaite Creek	50	12	62
Frieler Creek	0	55	55
Cherry Creek	50	8	58
Grand Total Flood Irrigation	3,190	2,723	5,913
Grand Total of Regular and Flood Irrigation (Missouri River Basin) in Madison County	111,996	16,656	128,652

BAKER DITCH (MUTUAL)

HISTORY

First use of the Baker Ditch in the early 1870's was by Palmer and Elizabeth Baker after whom the ditch was named. In later years the ditch was extended to include several other water users, namely: O. F. Gammel, William Stewart, Almond J. Wilcomb, and Frank Swartz.

PRESENT STATISTICS

Location: Point of diversion is the north bank of the Beaverhead River in the center of Section 11, Township 5 South - Range 7 West. Land irrigated by the ditch is located in Sections 24, 25, 26, and 36, Township 4 South - Range 7 West; and Sections 1, 2, and 11, Township 5 South - Range 7 West.

Length and Capacity of Canal: The ditch is approximately 5 miles long with a carrying capacity of 1000 miner's inches.

Operation and Maintenance: Through a mutual agreement of the water users, whenever the need arises, assessments are voluntary with minor construction and repair work done by the individuals themselves.

Present Users: There were 7 water users in 1953 under this ditch system.

Acreage Irrigated: In 1953 there were 578 acres irrigated by the Baker Ditch with 22 acres of potential irrigable land under the system.

WATER RIGHT DATA

The following decreed rights from the Beaverhead River, Case No. 1053, (Ref.: located in Beaverhead County Courthouse, Dillon, Montana), are carried in the Baker Ditch: Decreed to Palmer and Elizabeth Baker as of October 1, 1869, 288 miner's inches; Palmer and Elizabeth Baker, 60 miner's inches as of April 1, 1894; 92 miner's inches of the right decreed to Palmer and Elizabeth Baker of 112 miner's inches as of July 1, 1873; O. F. Gammel, 5 miner's inches as of July 1, 1873; 237¾ miner's inches of the right decreed William Stewart and A. J. Wilcomb of 317 miner's inches as of May 1, 1876; Frank Swartz, et al, 240 miner's inches as of April 1, 1894; and Frank Swartz, et al, 38 miner's inches as of April 1, 1894.

Although a water shortage exists on the Beaverhead River in Beaverhead County, the return flow to the stream from the irrigation above provides an ample water supply for the Baker Ditch in Madison County.

(See Maps in Part II, Pages 27, 35)

BEAVERHEAD CO-OP DITCH (MUTUAL)

HISTORY

The date of first use of the Beaverhead Co-op Ditch was in the year 1883 and among the first users in the ditch were Washington Nyhart, Frank Swartz, William Linder, O. F. Gammell, Carl Swanstrum, Palmer and Elizabeth Baker, William Stewart, A. J. Wilcomb, Ernest

Maurer, and Jordan Nyhart. A mutual agreement was entered into on December 29, 1950, providing for the operation, maintenance, and ownership of the water rights in the ditch. (Reference to agreement entered in Volume 155 of Miscellaneous Records, Page 243, Madison County).

PRESENT STATISTICS

Location: Point of diversion from the north bank of the Beaverhead River in the SE¼NE¼, Section 21, Township 5 South - Range 7 West. The ditch irrigates land in Sections 2, 3, 11, 14, 15, and 22, Township 5 South - Range 7 West; and Sections 25, 26, 35, and 36, Township 4 South - Range 7 West.

Length and Capacity of Canal: Flowing in a northeasterly direction, the canal is approximately 7 miles long with a capacity of 3600 miner's inches.

Operation and Maintenance: Assessments vary with a minimum charge set at $50 per share each year.

Present Users: This is a non-profit organization having 16 shares of stock issued and subscribed to, divided among 7 water users. One share of stock is equal to 181.80 miner's inches of water.

Acreage Irrigated: In 1953 there were 2029 acres irrigated under the Beaverhead Co-op Ditch with no acres of potential irrigable land under the system.

WATER RIGHT DATA

Water rights designated for use in the ditch have been decreed in Case No. 1053 for the Beaverhead River in the District Court of Beaverhead County at Dillon, Montana, and are as follows: 50 miner's inches as of May 1, 1866, decreed to Washington Nyhart and the William Linder Estate; 52½ miner's inches of and from 105 miner's inches as of May 1, 1866, decreed to Frank Swartz, et al; 57 miner's inches of and from 300 miner's inches decreed to Frank Swartz, et al, as of July 1, 1866; 240 miner's inches as of May 1, 1870, decreed to O. F. Gammell and William Stewart; 135 miner's inches as of May 10, 1870, decreed to William Linder Estate; 150 miner's inches as of May 12, 1870, decreed to Washington Nyhart; 108 miner's inches as of May 10, 1872, decreed to Carl Swanstrum; 120 miner's inches as of July 1, 1873, decreed to Frank Swartz; 20 miner's inches as of July 1, 1873, of and from 112 miner's inches decreed to Palmer and Elizabeth Baker; 120 miner's inches as of July 1, 1881, decreed to William Stewart and O. F. Gammell; 79¼ miner's inches of and from 317 miner's inches as of May 1, 1876, decreed to William Stewart and Almond J. Wilcomb; 37 miner's inches of and from 147 miner's inches as of October 1, 1878, decreed to William Stewart and A. J. Wilcomb; 180 miner's inches as of October 1, 1882, decreed to Washington Nyhart; 400 miner's inches as of February 15, 1883, decreed to Jordan Nyhart, et al; 360 miner's inches as of July 1, 1887, decreed to Washington Nyhart, et al; 200 miner's inches as of April 1, 1889, decreed to Ernest Maurer; 600 miner's inches as of July 15, 1895, decreed to Jordan Nyhart, et al.

No water shortage exists under this ditch system.

(See Maps in Part II, Pages 27, 35)

BIG HOLE CO-OP DITCH COMPANY (MUTUAL)

HISTORY

The first users in the Big Hole Co-op Ditch were Alphonse Pelon, Henry Utley, Alex McKay, Nahun Parker, and John Willhart. Originally this ditch was a side channel of the Big Hole River and called the "Owsley Slough." Construction of a wing-type concrete headgate regulates the water diverted from the Big Hole River into the Big Hole Co-op Ditch or "Owsley Slough."

PRESENT STATISTICS

Location: Point of diversion is on the west bank of the Big Hole River in the SE¼SW¼, Section 11, Township 4 South - Range 7 West with the ditch following an easterly direction. The ditch irrigates land in Sections 1, and 12, Township 4 South - Range 7 West; Sections 4, 5, 6, 7, and 8, Township 4 South - Range 6 West; and Sections 28, 31, 32, and 33, Township 3 South - Range 6 West.

Length and Capacity of Canal: About 5 miles long with the carrying capacity sufficient to supply all ditch diversions therefrom.

Operation and Maintenance: Assessments are made in proportion to the number of shares owned by individuals in the ditch. Operation and maintenance charges are negligible, as repairs are limited to the headgate on this natural water channel and each water user maintains his own diversion from the ditch.

Present Users: The 170 shares of stock listed for the ditch are divided among 19 individual shareholders.

Acreage Irrigated: In 1953 there were 2816 acres irrigated under the Big Hole Co-op Ditch with 75 acres of potential irrigable land under the system.

WATER RIGHT DATA

Appropriators of the water used in the Co-op Ditch are as follows: Alphonse Pelon, 400 miner's inches from a slough, tributary to the Big Hole River, as of the year 1881 or 1882 (Ref.: Book 11, Page 571); Alex McKay and Joseph Eno, 200 miner's inches from a slough, tributary of the Big Hole River, as of the year 1881 or 1882 (Ref.: Book 11, Page 570); Henry Utley, et al, 1500 miner's inches from the eastern branch of the Big Hole River, as of May 1, 1881 (Ref.: Book 10, Page 102); John Willhart, 1000 miner's inches from the Big Hole River as of July, 1881 (Ref.: Book 10, Page 132); John Willhart, 650 miner's inches from the Big Hole River as of July 1, 1881 (Ref.: Book 10, Page 458); Nahun Parker, 5000 miner's inches from the Big Hole River as of September 2, 1890 (Ref.: Book 10, Page 372); Angg Zack Aropoulos, 200 miner's inches from the Schoolhouse Slough, tributary of the Big Hole River, as of August 4, 1919 (Ref.: Book 20, Page 173); John C. Amarine, 200 miner's inches from the Big Hole River as of December 28, 1921 (Ref.: Book 20, Page 268); Charles C. Boyd, 120 miner's inches from the Big Hole River as of January 19, 1922 (Ref: Book 20, Page 270); Edward B. Page, 160 miner's inches from the Big Hole River as of January 20, 1922 (Ref.: Book 20, Page 269); Lott Estate Incorporated, 200 miner's inches from the Big Hole River as of May 18, 1922 (Ref.: Book 20, Page 286); Ed Hill, 200 miner's inches from the Big Hole River as of September 27, 1922 (Ref.: Book

20, Page 285); and Ed Hill, 100 miner's inches from the Big Hole River as of September 27, 1922 (Ref.: Book 20, Page 284). (All references are from Water Right Records in Madison County).

Fourteen users claim and use all or part of the above rights. Five users claim only "use rights" that can be dated back to the first meeting of the ditch Company on October 21, 1913.

(See Maps in Part II, Pages 19, 26, 27)

CREEKLYN DITCH (MUTUAL)

HISTORY

The first users in what is now known as the Creeklyn Ditch were Alfred Knight and John B. Wellcome. The ditch was decreed on April 8, 1932, Case No. 2655. A supplement to this decree was made on March 13, 1939. The ditch was again decreed on March 22, 1945, Case No. 3437. (Ref.: Judgment Book 18, Page 567; and Judgment Book 19, Page 526, both in Madison County).

PRESENT STATISTICS

Location: Point of diversion is on the northwest bank of the Jefferson River in the NW¼NW¼ of Section 26, Township 2 South - Range 6 West. The ditch follows a general northerly direction irrigating land in Sections 15, 21, 22, 29, 30, 31, and 32 in Township 1 South - Range 5 West.

Length and Capacity of Canal: Approximately 13½ miles long with a carrying capacity of 1300 miner's inches. 12 miles of the ditch is located in Madison County, with 1½ miles extending to Fish Creek in Jefferson County.

Operation and Maintenance: These costs vary from year to year and assessments are made proportionately according to the amount of water each user carries in the ditch.

Acreage Irrigated: In 1953 there were 752 acres irrigated under the Creeklyn Ditch with no other potentially irrigable land under the system.

WATER RIGHT DATA

The Creeklyn Ditch decree, Case No. 2655, lists 3000 miner's inches of water appropriated on October 3, 1897, by Alfred Knight and John B. Wellcome who were the predecessors in interest to the four present tenants in common in the Creeklyn Ditch (Ref.: Recorded in Book 11 of Water Rights, Page 210, Madison County). In the latest decree of the ditch, Case No. 3437, only 1300 miner's inches of the appropriated right of 3000 miner's inches is defined for use in the Creeklyn Ditch. The 1300 miner's inches is divided into "A" and "B" rights with 1000 miner's inches designated "A" rights and 300 miner's inches listed as "B" rights. The 1000 miner's inches of "A" rights are superior in all respects to the "B" rights whenever there is insufficient water available from the Jefferson River to supply the full 1300 miner's inches in the Creeklyn Ditch. The water supply available is considered adequate during a normal water year.

(See Map in Part II, Page 6)

O'DELL DITCH (MUTUAL)

HISTORY

Among the first water users in the O'Dell Ditch were William Evans, Florence E. Jeffers, J. F. Hayden, H. H. Mitchell, J. W. Saunders, S. R. Smith, A. W. Switzer, and Thomas H. Whitney.

In May 1921 a mutual agreement was entered into between W. Reints, William P. Piper, Thos. H. Whitney, S. R. Pasley, Jos. W. Evans, D. W. Raymond, D. H. Morris, H. H. Mitchell, and Amanda Saunders setting forth in writing their respective ownership, interest, obligations, and liabilities under the ditch system. Ownership and water rights are defined with one share representing 1/10 of the water flowing through the ditch. As a means of convenience one share represents 200 miner's inches of water except in the case of H. H. Mitchell who owns an additional 50 miner's inches, but which said 50 miner's inches has no priority over the other water running in the ditch.

PRESENT STATISTICS

Location: The ditch diverts water from the east bank of O'Dell Creek in the NW¼NW¼ of Section 21, Township 6 South - Range 1 West. Following a northerly direction, the ditch supplies water for irrigation in Sections 26, 27, 34, and 35, Township 5 South - Range 1 West; and Sections 2, 3, and 9 in Township 6 South - Range 1 West.

Length and Capacity of Canal: The ditch is about 5 miles long and will carry the full 2050 miner's inches of water required.

Operation and Maintenance: Each owner shall and must pay his proportionate share of the upkeep of the ditch, such as ditch repair, placing of bridges whenever required, and in keeping the main headgate intact.

Present Users: There are 10 active shareholders having 1 share each which is the total of the original shares listed for the ditch.

Acreage Irrigated: In 1953 there were 892 acres irrigated by the O'Dell Ditch with 186 acres of potential irrigable land under the system.

WATER RIGHT DATA

As stated in the agreement made in May 1921, "The parties of the above named, and their predecessors in interest, have owned and used said ditch for more than 30 years past and have claimed the right to use all of the waters flowing in O'Dell Creek at the point where the main headgate of said O'Dell Ditch taps O'Dell Creek." In addition to the claim of a "use right" mentioned above, the O'Dell Ditch claims the following recorded appropriation: By Florence E. Jeffers, et al, from O'Dell Creek, 1600 miner's inches or 40 cu. ft. per sec. as of June 1, 1901 (Ref.: Book 16, Page 135, Water Right Records, Madison County).

There has never been a shortage of water in O'dell Creek, a tributary of the Madison River, and therefore the O'Dell Ditch has an ample water supply during the entire irrigation season.

(See Maps in Part II, Pages 31, 37).

PAGEVILLE CANAL COMPANY (MUTUAL)

HISTORY

The first water use in what is now known as the Pageville Canal Company was by Fred Page, Mrs. Carrie Whitney, O. S. Talcott, H. A. Redfield, Fred Mercer, W. R. Page, E. D. Wilcomb, Elmer H. Page, W. J. Linder, A. E. Wilcomb, T. D. Bushnell, Frank S. Watters, C. W. Page, and J. W. Brook. These people are the 14 original members of the Canal. This ditch has operated under a mutual agreement since April 11, 1899.

PRESENT STATISTICS

Location: Point of diversion is on the west bank of the Big Hole River in the NW¼SE¼, Section 21, Township 4 South - Range 7 West, the ditch flowing in a general northeast direction. Irrigation of land under this system is located in Sections 11, 12, 13, 14, 15, 22, 23, and 24, Township 4 South - Range 7 West; and Sections 7, 8, 9, and 18, Township 4 South - Range 6 West.

Length and Capacity of Canal: The main canal is about three-fourths of a mile in length, at this point it then divides into private diversions. The capacity of the main canal will carry approximately 8000 miner's inches.

Operation and Maintenance: Assessment for O. & M. charges vary and have been about 20 to 30 dollars per share, depending upon the amount of repairs necessary for efficient operation of the system.

Present Users: There are 20 shares issued by this mutual ditch which are divided among 21 members. One share is equivalent to 357 1/7 miner's inches which is based on the 14 original shareholders and a water right of 5000 miner's inches.

Acreage Irrigated: In 1953 there were 2739 acres irrigated by the Pageville Canal Company with 125 acres of potential irrigable land under the system.

WATER RIGHT DATA

The only water right on record was appropriated by the Pageville Canal Company, 5000 miner's inches from the Big Hole River as of May 25, 1901 (Ref.: Book 16, Page 5, Water Rights). Other appropriative rights claimed and used, but not recorded to the company, are as follows: Appropriated by Henry Elling, J. W. Brook, and Alfred Ledoux, 3000 miner's inches from the Big Hole River as of April 1878 (Ref.: Book 10, Page 28, Water Rights); and an appropriation by James M. Page, 2000 miner's inches from the Big Hole River as of the year 1882 (Ref.: Book 16, Page 268, Water Rights).

The water supply is considered adequate under this Canal.

(See Maps in Part II, Pages 26, 27)

PARROT DITCH COMPANY

HISTORY

The earliest existence of what is now known as the Parrot Ditch was in the year of 1888 and was constructed for the Gaylor Smelter, located near Whitehall, Montana, for custom

smelting. A large quantity of land was purchased to secure water rights and smelter property. An interest in the All Nations Ditch, which ran parallel to the smelter ditch, was purchased and extended. The Gaylor Smelter, however, was never built and the Parrot Silver and Copper Company became the successor in interest to the property.

In 1909 or 1910, due to the washout of a dam on the Madison River, the Madison Power Company purchased the ditch and 4700 acres of land for power purposes. While under control of this Company water was sold to farmers in the area through the Parrot Ditch for irrigation of their land.

About 1915 Lewis Penwell acquired the property and organized the Parrot Ranch Company, probably as a subsidiary of the Montana Power Company to dispose of the land.

On the 20th day of July, 1916, Articles of Incorporation were filed by the Parrot Ditch Company to acquire, own, hold, manage, control, operate, and maintain the irrigation system owned by the Parrot Ranch Company. The term of existence for the incorporation was 40 years and will expire July 20, 1956. In 1916 the Parrot Ditch Company acquired all rights and interest in the Methodist Ditch.

PRESENT STATISTICS

Location: The point of diversion is on the north bank of the Jefferson River in the SW¼NW¼, Section 18, Township 2 South - Range 5 West. Land irrigated is located in Sections 4, and 5, Township 2 South - Range 5 West; Sections 13, 24, 25, 26, 33, 34, and 35, Township 1 South - Range 5 West; Sections 6, 7, and 18, Township 1 South - Range 4 West; Sections 12, 13, 14, 15, 22, 23, and 28, Township 1 North - Range 4 West; and Sections 7, 8, 17, and 18, Township 1 North - Range 3 West.

Length and Capacity of Canal: The ditch follows a generally northeasterly course for a distance of 26 miles, and has a capacity large enough to deliver the required amount of water for the project. The system contains several small structures such as spillways, drops, etc., largest of these being a tunnel one-quarter of a mile in length.

Operation and Maintenance: The amount of capital stock in this Corporation is $8,000 divided into 8000 shares having a par value of $1.00 each, and one share intended to represent one acre of land. Each share of the capital stock represents one undivided 1/8000 interest in the ditch and water rights, with a share equivalent to 1 miner's inch of water. The stock of the Company is divided into 3 classes "A," "B," and "C." "A" stock, listed as treasury stock, is not assessable and non-participating in the Company. Class "B" stock is held by farmers at the lower end of the project, and embraces all the shares representing water rights pertinent to, or attached to, land lying below what is known as the Doherty Over-flow. Class "C" stock is owned by farmers at the upper end of the project above the Doherty Over-flow.

Assessments for operation and maintenance in 1953 were: Class "C" stock 40 cents per share; and "B" stock 60 cents per share, also a charge was made during the year on the class "B" stock of 40 cents for additional improvements. Some water shortages occur in the Parrot Ditch during the latter part of the irrigation season and it was necessary for the Company to supplement this shortage of water by purchasing 1500 acre feet from the Ruby River Reservoir. This water is distributed among the shareholders in the amount of .30 miner's inches inches per share.

Present Users: There are 20 water users owning 2497½ shares of "B" stock, and 28 members with 1760 shares of "C" stock.

The Parrot Ditch delivers water to 3 private independent ditches. Through an agreement with the Company, the All Nations, Buhl, and Hunt Ditches are supplied water from the main canal of the Parrot Ditch Company.

Acreage Irrigated: In 1953 there were 3839 acres irrigated by the Parrot Ditch Company with 362 acres of potential irrigable land under the system.

WATER RIGHT DATA

Water rights claimed and used by the Parrot Ditch Company are as follows: Appropriated by T. D. Townsend from the Jefferson River as of September 8, 1394, 20,000 miner's inches (Ref.: Book 10, Page 563, Water Rights); from predecessors in interest a water right of 1500 miner's inches from the Jefferson River as of January 24, 1880; 2800 miner's inches of 10,000 miner's inches appropriated by Henry Nolte, et al, from the Jefferson River as of October 15, 1891. (The balance of this right, 7200 miner's inches, is claimed and used by the All Nations Ditch), (Ref.: Book 10, Page 55, Water Rights); 55 Miner's inches of 2000 miner's inches appropriated by Christopher Elliott from the Jefferson River as of December 1881 (Ref.: Book 10, Page 26, Water Rights); and 1500 acre feet from the Ruby River Reservoir Storage Project. (Refer to "Ruby River Reservoir" for Water Rights).

There is some shortage of water in the Parrot Ditch from the Jefferson River. However, the 1500 acre feet purchased from the Ruby River Reservoir provides enough additional water to make up for this shortage. This 1500 acre feet is not used every year but was used during the 1953 season.

(See Map in Part II, Pages 2, 3, 6, 13)

THE INDIAN CREEK DITCH AND IRRIGATING COMPANY

HISTORY

The first users in The Indian Creek Ditch were Henry Elling, Mary B. Elling, William Ennis, Henry S. Gilbert, John Reed, Gilman Sawtelle, Daniel W. Tilton, Charles K. Cole, and L. W. Howe. This ditch was first incorporated on January 13, 1904, for a period of 40 years, and reincorporated on August 17, 1943. 18,000 shares of stock were issued with all shares subscribed. Par value of the stock is listed at $1.00 per share with one share equal to 1/10 of one miner's inch of water.

PRESENT STATISTICS

Location: The point of diversion is about one-half mile below the mouth of Indian Creek Canyon on the north bank of the stream in the SE¼SW¼ of Section 26, Township 8 South - Range 1 East. One ditch follows in a northerly direction for about 5 miles where it spills into Bear Creek and from Bear Creek is used in several private diversions. Another ditch 12 miles long follows a northerly direction and diverts water directly from Indian Creek. Land irrigated under the system is in Sections 3, 4, 10, 15, 16, 21, and 22 in Township 8 South - Range 1 East; Sections 27, and 34 in Township 7 South - Range 1 East and Sections 3, 24, 25, and 26 in Township 7 South - Range 1 West.

Length and Capacity of Canal: The total length of the ditch system is about 17 miles and sufficient to distribute 10,000 miner's inches statutory measurement.

Operation and Maintenance: The stock is assessable with the costs varying from year to year as provided by the By-Laws of the company.

Present Users: All of the 18,000 shares of stock are subscribed to and is divided among 7 active stockholders in the company.

Acreage Irrigated: In 1953 there were 1458 acres irrigated under The Indian Creek Ditch and Irrigating Company with 1222 acres of potential irrigable land under the system.

WATER RIGHT DATA

In the decree of Indian Creek, tributary of the Madison River, Case No. 893, The Indian Creek Ditch and Irrigating Company was decreed 1600 miner's inches as of the priority date May 1, 1882; 2000 miner's inches as of date June 1, 1902; and 1000 miner's inches as of date June 1, 1907; making a total of 4600 miner's inches. Of this total, 1800 miner's inches are considered regular flow rights, and 2800 miner's inches as high water or flood rights (Ref.: Judgment Book 16, Page 54, Madison County). There is some shortage of water during the late summer, especially during an extremely dry year.

(See Map in Part II, Pages 37, 42, 43, 48)

THREE CREEKS WATER COMPANY

HISTORY

The Three Creeks Water Company was originally the Three Creeks Ranch Company. This name was derived from the fact that the water comes from Wisconsin, Indian, and Mill Creeks. Originally there were 3224 shares of water, less 260 shares to be cancelled, valued at $10.00 per share, and owned by the several directors of the Three Creeks Ranch Company. The ranch holdings were sold and the successors in interest set up the Three Creeks Water Company, incorporating as such on February 21, 1916, for a period of 40 years. Capitol stock was the sum of $32,240 divided into 3224 shares of common stock valued at $10 per share.

PRESENT STATISTICS

Location: There are five company owned reservoirs, namely: Sunrise on Wisconsin Creek, with a capacity of 127 acre feet; Jackson on Wisconsin Creek, with a capacity of 180 acre feet; Noble on Wisconsin Creek, with a capacity of 233 acre feet; Lower Branham on Mill Creek, with a capacity of 180 acre feet; and Hill on Indian Creek, with a capacity of 220 acre feet. All reservoirs are located in Township 3 South - Range 4 West. Two additional reservoirs, Rossiter and Blossom were owned by the Company, but have been sold to private parties.

Length and Capacity of Canals: Stored water is released into the stream channels of Wisconsin, Indian, and Mill Creeks, and diverted into three Company owned and four private owned ditches for distribution to users. The principal responsibility of the Company itself is water storage. The capacity of the reservoirs can be increased by 25 to 50 percent whenever economically feasible.

Operation and Maintenance: The cost of operation and maintenance has averaged around $1200 per year for the system. On a water charge basis this cost would amount to between 45 and 50 cents per acre foot used.

Present Users: In 1953 there were 16 users holding 2594 shares of stock, each share to represent one miner's inch of water, and valued at $10 per share.

Acreage Irrigated: In 1953 there were 1866 acres irrigated and supplemented, and an additional 200 acres were potentially irrigable under the system.

WATER RIGHT DATA

The following decreed water rights are used by the Three Creeks Water Company: From Wisconsin Creek: The third right of 150 miner's inches dated October 15, 1865, decreed to Dickey Brothers; The sixth right of 100 miner's inches dated November 1, 1865, decreed to Daniel Whisman; the seventh right of 100 miner's inches dated November 1, 1865, decreed to George B. Rowe; the eighth right of 100 miner's inches dated April 10, 1866, and the twelfth right of 50 miner's inches dated April 10, 1867, decreed to Thomas Lewis; and the fifteenth right of 100 miner's inches dated June 20, 1867, decreed to Mary A. Goetschins.

From Indian Creek: The sixth right of 50 miner's inches dated April 20, 1866, decreed to Marie E. Edelmann; the tenth right of 50 miner's inches dated April 15, 1867, decreed to D. L. Whisman; the seventeenth right of 20 miner's inches dated April 16, 1872, decreed to D. L. Whisman; the thirtieth right of 100 miner's inches dated April 10, 1894, decreed to D. L. Whisman; the thirty-second right of 100 miner's inches dated June 1, 1896, decreed to Marie E. Edelmann; and the thirty-third right of 100 miner's inches dated June 1, 1896, decreed to D. L. Whisman.

From Mill Creek: The sixteenth right of 5 miner's inches dated May 1, 1867, decreed to J. Y. Baker; the eighteenth right of 50 miner's inches dated October 15, 1869, decreed to Marie E. Edelmann; the twenty-sixth right of 20 miner's inches dated January 1, 1879, decreed to Toledo M. and P. Company; and the twenty-seventh right of 75 miner's inches dated March 1, 1881, decreed to Marie E. Edelmann.

(Reference); Wisconsin Creek was decreed September 9, 1901, and recorded in Judgment Book 12, Page 595, Case No. 441, Madison County; Indian Creek was decreed August 30, 1905, and recorded in Judgment Book 14, Page 213, Case No. 741, Madison County; and Mill Creek was decreed February 6, 1908, and recorded in Judgment Book 14, Page 408, Case No. 874, Madison County. These decrees should be taken into consideration in the pending Ruby River Decree and its tributaries, (Case No. 3089, Madison County) which in turn will invalidate the separate decrees on Wisconsin, Mill and Indian Creeks.

The following appropriated rights from Wisconsin Creek are used: 300 miner's inches appropriated September 29, 1903, by D. L. Whisman and George Rowe (Ref.: Book 16, Page 362); 280 miner's inches appropriated October 15, 1903, by Henry F. Noyd (Ref.: Book 16, Page 375); 200 miner's inches appropriated October 30, 1903, by Dickey Brothers (Ref.: Book 16, Page 378); 200 miner's inches appropriated October 30, 1903, by Thomas Lewis (Ref.: Book 16, Page 379); 200 miner's inches appropriated November 18, 1903, by Angeline R. Siprelle (Ref.: Book 16, Page 387); 400 miner's inches appropriated April 1, 1904, by H. F. Noyd, Thomas Lewis, and J. C. Galahan (Ref.: Book 16, Page 408); 100 miner's inches appropriated September 7, 1904,

by James Head (Ref.: Book 16, Page 481); 240 miner's inches appropriated June 15, 1905, by Fred H. Wolverton (Ref.: Book 16, Page 584); 160 miner's inches appropriated January 1, 1906, by H. E. Snyder (Ref.: Book 17, Page 7); and 160 miner's inches appropriated June 13, 1906, by Thomas Kalgren (Ref.: Book 16, Page 570). The above decreed and appropriative water rights give the Three Creek Water Company a grand total of 3410 miner's inches of water. Not listed in records of the Ditch Company is a flood right of 80 miner's inches appropriated August 2, 1917, by the Three Creeks Water Company (Ref.: Book 20, Page 133). (All references for the above appropriative filings are from Water Right Records in Madison County).

At high water flow the water is used at the rate of one inch per acre, and as the high water flow decreases each shareholders' water is cut by direct percentage of flow in the ditch.

(See Maps in Part II, Page 25)

WEST MADISON CANAL COMPANY (INCORPORATED)

HISTORY

First users in this ditch system were Henry Buford, T. J. Wilson, and Nancy Comley. About the year of 1910 this ditch operated as a co-partnership mutual and was called the West Side Canal. On April 25, 1942, Articles of Incorporation were drawn up and the name changed to the West Madison Canal Company. The corporate life of this Association shall be for a continual existence and does not have any capital stock, nor is this Association organized for the purpose of profit. The membership of the Association is divided into 3200 units and each member issued a certificate setting forth his interest in the Company in units.

PRESENT STATISTICS

Location: The point of diversion is on a channel of the Madison River known as Spring Creek, in the SW¼NW¼ of Section 29, Township 6 South - Range 1 West, the ditch following a generally northerly direction. Land irrigated under the system is in Section 33, Township 4 South - Range 1 West; Sections 3, 4, 8, 9, 16, 17, 20, 21, 28, 29, and 32, Township 5 South - Range 1 West; and Sections 4, 8, and 9, Township 6 South - Range 1 West.

Length and Capacity of Canal: Approximately 12 miles in length with a capacity to carry the full 3200 miner's inches of water required.

Operation and Maintenance: Assessments are made according to the number of units held by water users. In 1952 O. &. M. charges amounted to $1.00 per unit but the water charges have averaged only 50 cents for the past several years. One unit is equivalent to one miner's inch of water, and in this particular area 1½ miner's inches are used for each acre of irrigated land.

Present Users: The membership of the Association consists of 11 water users with the 3200 units divided among the members.

Acreage Irrigated: In 1953 there were 2494 acres irrigated by the West Madison Canal Company with 11 acres of potential irrigable land under the system.

WATER RIGHT DATA

The water right claimed by the West Madison Canal Company is recorded in an agreement executed on the 1st day of December, 1917, in which the Company defines the use of 3200 miner's inches of the waters of the Madison River to be carried in the West Madison Canal (Ref.: Book 98 of Miscellaneous Records, Page 125).

There is no water shortage under this canal system.

(See Maps in Part II, Pages 23, 31, 37)

RUBY RIVER STORAGE PROJECT

Including West Bench Canal, Vigilante Canal, and Main Canal

(State Water Conservation Board)

HISTORY

Construction of this project started on January 11, 1937, and the project first operated during the year of 1938. On October 16, 1936, the State Water Conservation Board received a Federal loan offer which called for the construction of one earth-filled dam and appurtenances at an estimated cost of $520,000 of which $234,000 was to be a grant and $286,000 a loan, the loan to be evidenced by Water Conservation revenue bonds, Series "H." This required the formation of the Ruby River Water Users' Association and the sale of 40,000 acre feet of water under contracts acceptable to the Finance Division of the PWA. The Ruby River Water Users' Association was incorporated under the laws of Montana on December 22, 1936.

After considerable effort and delay, water purchase contracts (see page 52) were secured which were acceptable to the PWA.

In order to supply water for a large irrigable area in the vicinity of Alder and Sheridan it was necessary to construct additional ditches for distribution of the stored water. In Conjunction with this storage project for distribution of the water, a canal system was constructed which includes a Main Canal, West Bench, and Vigilante Canals. To administer operation of these canals separate associations were formed for the canal systems.

On August 23, 1943, Articles of Incorporation were filed forming the West Bench Canal Users' Association, and on September 17th of the same year the Vigilante Canal Users' Association filed Articles of Incorporation.

PRESENT STATISTICS

Location: The Ruby River Storage Reservoir is located about 6 miles south of the town of Alder and has a drainage area above the reservoir of 560 square miles, situated in the high, timbered slopes of the Ruby, Snowcrest, and Gravelly Mountains. This Project was set up to furnish a full water supply for 14,000 acres of land and a supplemental supply for 20,000 acres along both the Ruby and Jefferson River Valleys.

Point of diversion of the Main Canal is in the SW¼SW¼ of Section 4, Township 7 South - Range 4 West, and follows a northerly direction along the west side of the Ruby River to its junction with the Vigilante and West Bench Canals.

The Vigilante Canal diverts its water from the main diversion canal approximately one-half mile below the dam in the NE¼NW¼ of Section 4, Township 7 South - Range 4 West. The main canal furnishes water to the Vigilante Canal by means of a siphon across the Ruby River for an area east of the river.

Point of diversion of the West Bench Canal is from the main diversion canal located in the NE¼NW¼ of Section 4, Township 7 South - Range 4 West, and furnishes water for irrigation on the west side of the Ruby River.

Length and Capacity of Canals and Reservoir: The storage capacity of the reservoir is 38,850 acre feet with the flooded area totaling 1143 acres, forming a lake approximately 3 miles long.

The Main Canal, which diverts directly from the Ruby River a short distance below the dam, is 5/8 of a mile long and has a capacity of 205 second-feet.

The Vigilante Canal has a carrying capacity of 115 second-feet and is approximately 20 miles long. On July 1, 1954, a contract was let for an extension of this Canal, and present plans call for the completion of this work by June 1, 1955. The extension will be 5.3 miles in length with the extension canal terminating north of Sheridan at Wisconsin Creek.

The West Bench Canal is 11.4 miles long with a capacity of 85 second-feet.

Operation and Maintenance: O. & M. charges for the storage reservoir are administered under the Ruby River Water Users' Association. Assessments in 1953 for payment of the principle on the reservoir amounted to 56 cents per acre foot, with O. & M. charges listed at 15 cents an acre foot, making a total charge of 71 cents.

This water charge for the reservoir will also be assessed to the members of the Vigilante Canal Users' Association, and the West Bench Canal Users' Association in addition to their own charges under the Canal systems. Besides furnishing water to the Vigilante and West Bench Canals there are many private ditch diversions receiving stored water directly from the Ruby River.

Assessments of the West Bench Canal Users' Association in 1953 were 30 cents per acre foot as payment on the principle for the Canal and 20 cents per acre foot for O. &. M., totaling 50 cents per acre foot.

For the Vigilante Canal Users' Association, during the year of 1953, water charges were 40 cents an acre foot for payment of the principal on the Canal system, with an additional 33 cents per acre foot for O. & M., totaling 73 cents per acre foot.

The water charges on the West Bench and Vigilante Canals are included and cover the operation, maintenance, and principle-payment costs of the Main Canal.

Present Users: In the Ruby River Water Users' Association for the year of 1953 there were 26 water purchasers buying 8450 acre feet of stored water. The 26 water users are exclusive of the members buying stored water in the Vigilante and West Bench Canals.

In 1953, under the Vigilante Canal Users' Association there were 28 water users purchasing 4910 acre feet.

Under the West Bench Canal Users' Association in 1953, 20 farmers were purchasing 4900 acre feet of stored water. It should be noted that there are 8 users carrying individual decreed water rights in this canal in addition to the stored water they are purchasing.

Acreage Irrigated: In 1953 there were 13,229 acres irrigated or supplemented by stored water of the Ruby River Reservoir from private ditch diversions, with 1290 acres potentially irrigable.

From the Vigilante Canal there were 3221 acres irrigated or supplemented by stored water from the Ruby River Reservoir, with 418 acres potentially irrigable.

Under the West Bench Canal there were 2303 acres irrigated or supplemented by stored water from the Ruby River Reservoir, with 354 acres potentially irrigable.

WATER RIGHT DATA

Prior to the construction of Ruby River Storage Project several water filings were made on the Ruby River by the Montana State Water Conservation Board. The most recent filing by the Water Board was made April 8, 1938, on all of the unappropriated waters of the Ruby River and its tributaries (Ref.: Book 20, Page 411 of Water Right Records, Madison County). The adjudication of the Ruby River and its tributaries (*pending) Case No. 3089, lists the following decreed water rights for the Ruby River Storage Project. Decreed to the State Water Conservation Board: All of the waters of Garden Creek as of May 15, 1880; 100 miner's inches of a certain Spring and Lake as of April 26, 1892; 200 miner's inches of the West Fork waters of the Ruby River as of September 3, 1928; and all unappropriated waters of the Ruby River and its tributaries as of April 8, 1938.

*The Ruby River decree is still in the process of litigation, although not a final decree, it has in many instances been administered according to the Findings of Fact and Conclusions of Law. Many of the rights on tributary streams which were formerly decreed have not been included in the present pending decree of the Ruby River. If the parties who have these valid decreed water rights on the tributary streams are not considered when the present pending decree becomes final, it may result in another adjudication suit sometime in the future.

(See Maps in Part II, Pages 2, 3, 6, 13, 14, 25, 26, 32, 33, 40, 45, 50, 51, 56, 59)

WILLOW CREEK STORAGE PROJECT
(State Water Conservation Board)

HISTORY

Construction of this project began on June 16, 1936, with the project in operation during the season of 1938.

On December 31, 1935, the State Water Conservation Board received a Federal loan offer which called for construction of the earth-filled dam and appurtenant works at an estimated cost of $232,727, of which $104,727 was to be a grant, and $128,000 a loan, the loan to be evidenced by Water Conservation bonds, Series "C." This required the formation of the Willow

Creek Water Users' Association and the sale of 12,000 acre feet of water under water purchase contracts (see page 52) approved by the PWA. The Willow Creek Water Users' Association was incorporated under the laws of Montana on November 18, 1935.

In order to pay off the cost of the Project to the State Water Conservation Board, the Willow Creek Water Users' Association entered into a water marketing contract (see pages 51 & 52) with the board in which the Association agreed to pay to the State Water Conservation Board the sum of $9,000 on December 15th each year, beginning with the year 1937, to and including the year 1965. On this project the lands above the reservoir are benefited through the exchange of stored water for prior normal flow rights belonging to lands below the reservoir.

PRESENT STATISTICS

Location: The Willow Creek Storage Reservoir is located at the junction of Willow and Norwegian Creeks, about 4 miles east of Harrison and 9 miles south of the town of Willow Creek. No canals were included in the construction of this project. Drainage area above the reservoir is 160 square miles, situated in the high, timbered, Tobacco Root Mountains and foothills. The water stored by this project will furnish a supplemental supply for irrigation of 12,000 acres of land along the Willow Creek Valley between the towns of Pony, Harrison, and Willow Creek in Madison and Gallatin Counties.

Length and Capacity of Reservoir: The storage capacity of the reservoir is 17,760 acre feet, with the flood area totaling 868 acres.

Operation and Maintenance: For the year 1953 assessments for re-payment cost of the reservoir were 75 cents per acre foot, plus an O. & M. charge of 20 cents per acre foot.

Present Users: During the year of 1953 there were 25 members of the Willow Creek Water Users' Association purchasing 3193 acre feet of stored water, in addition to some 3905 acre feet used in Gallatin County.

Acreage Irrigated: In 1953 there were 8710 acres of land irrigated entirely or supplemented by the stored water of the Willow Creek Reservoir, with 708 acres potentially irrigable under existing ditch facilities.

WATER RIGHT DATA

Appropriations filed by the State Water Conservation Board and in use on the Willow Creek Storage Project, consists of the following: All of the unappropriated water of Willow Creek and its tributaries as of August 20, 1935 (Ref.: Book 3, Page 454 of Water Right Records, Gallatin County); also all the unappropriated waters of Norwegian Creek and its tributaries as of August 20, 1935 (Ref.: Book 20, Page 386 of Water Right Records, Madison County).

(See Maps in Part II, Pages 1, 4, 10, 11)

WATER MARKETING CONTRACT

This is an agreement between the Water Users' Association and State Water Conservation Board, whereby the Board agrees to sell to the Association all of the available water of the project, and the Association agrees to distribute same to water purchasers and provides

method of payment of sums due, levying of assessment for operation and maintenance cost, time of notification of such levy to be given water purchasers, time of default and remedies in the event of default.

WATER PURCHASE CONTRACT

This is a three party contract entered into between the individual water purchaser, the Association and State Water Conservation Board, whereby, the individual agrees to purchase a definite amount of water, and to pay therefore a definite sum of money on or before a definite day, until a definite future date; in addition to such definite annual sum the individual agrees to pay such additional sum or sums as may be required annually as his proportionate share of the cost of operation and maintenance of the Association. This contract is void unless the water purchaser executes a Subscription and Pledge Agreement.

WATER RIGHT DATA—MADISON COUNTY
APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
MISSOURI RIVER BASIN							
***Missouri River**							
Jefferson River	50	412,806	10,320.150	2271[1]	—	8,000	200.000
				3437[1]	—	1,300	32.500
Beaverhead River	24	18,300	457.500	1053[4]	47	6,629	165.725
				3149[1]	6	1,789.5	44.737
Carter or Bishop Creek	4	580	14.500				
Cedar Spring	1	200	5.000				
Hoffman Creek	2	220	5.500				
Sauer Spring	1	20	.500				
Strawberry Spring	1	80	2.000				
Wishard Spring	1	All	——				
Unnamed Spring	1	100	2.500				
Stone Creek	4	820	20.500				
Crittenden Creek	2	200	5.000				
Winnipeg Creek	3	600	15.000				
Kneehill Spring	1	80	2.000				
Lasich Spring	1	80	2.000				
Neil Spring	1	40	1.000				
Unnamed Spring	1	All	——				
Lakes, Ponds and Reservoirs	1	500	12.500				
Spring Creek	6	1,140	28.500	1162	2	All	——
Reesor Creek	2	210	5.250				
Underwood Creek	2	560	14.000				
Antelope Spring	3	240	6.000				
Heaney Spring	1	160	4.000				
Mud Spring	1	540	13.500				
Unnamed Spring	2	160	4.000				
Willow Spring Creek	1	100	2.500				
Violet Creek	1	160	4.000				
Cottonwood Spring	1	160	4.000				
Trout Creek	4	950	23.750	1162	(See Spring Creek)		
Cold Spring Creek	2	50	1.250				
McHessor Creek	4	440	11.000				
Howser Spring	1	200	5.000				
Frank Creek Canyon	1	150	3.750				
McHessor Spring	1	50	1.250				
Brooks Canyon	1	All	——				
Wheat Canyon	1	All	——				
Mud Spring	1	100	2.500				
Spring Canyon Creek	1	All	——				
Charlton Slough	2	600	15.000				
Unnamed Springs	1	8,000	200.000				
Unnamed Sloughs	2	600	15.000				
California Slough	1	1,500	37.500				
Spring Creek	1	1,500	37.500				
Georgia Gulch Creek	2	1,500	37.500				

*Names of streams indented on the lefthand margin indicate that they are tributaries of the first stream named above which is not indented.

WATER RIGHT DATA—MADISON COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Ruby River or Stinking Water or Passamari	64	384,120	9,603.000	1178[1]	—	1,859	46.475
				1393[1]	—	720	18.000
				3089[2]	134	56,065.25	1,401.631
				2041 & 2042	23	12,437.00	310.925
Poisoned Spring	1	100	2.500				
Corral Creek	1	All	——				
Swamp Creek	0	0	0				
Lost Creek	1	100	2.500				
Little Basin Creek	2	1,300	32.500				
West Fork Ruby River	0	0	0				
Timber Creek	1	——	——				
Mill Creek	1	All	——				
Fawn Creek	4	1,600	40.000	See Ruby River			
Cottonwood Creek	2	7,000	175.000	See Ruby River			
Short Creek	1	40	1.000	See Ruby River			
Lewis Creek	2	40	1.000				
Lazyman Creek	1	120	3.000	See Ruby River			
Warm Spring Creek	3	3,100	77.500	See Ruby River			
French Creek	0	0	0				
Unnamed Springs	1	10	.250				
Ice Creek	2	715	17.875	See Ruby River			
Jack Creek	3	500	12.500	See Ruby River			
Bone Basin Canyon	1	All	——				
Cream Creek	1	300	7.500	See Ruby River			
Willow Creek	3	——	——	See Ruby River			
Willow Spring	1	All	——				
Ledford Creek	6	2,130	53.250	646	5	1,925	48.125
				3089[2]	(See Ruby River)		
Unnamed Springs	1	500	12.500				
Spring Creek	4	20	.500				
Spring Gulch	2	200	5.000				
Greenhorn Creek	6	1,900	47.500	1495	2	220	5.500
				3089[2]	(See Ruby River)		
Robb Creek	11	50,190	1,254.750	1486	5	1,660	41.500
				3089[2]	(See Ruby River)		
Dry Hollow Creek	1	320	8.000				
Sweetwater Creek	10	1,540	38.500	2832	5	1,249	31.225
				3089[2]	(See Ruby River)		
Wilson Creek	1	320	8.000				
James Creek	1	All	——				
Estell Spring	1	160	4.000	See Ruby River			
Gartman Spring	1	320	8.000				
Pine Butte Spring	2	360	9.000				
Guidice Spring	1	200	5.000				
Harden Spring	1	40	1.000				
North Fork Sweetwater Creek	0	0	0				
Unnamed Spring	1	20	.500				
Quaking Asp Spring	2	360	9.000				

WATER RIGHT DATA—MADISON COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Deereed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Virginia Spring	1	40	1.000				
Badger Spring Creek	2	175	4.375				
Sheep Creek	2	150	3.750				
Ball Spring Creek	2	150	3.750				
Callaway Creek	3	840	21.000	636	3	892	22.300
				3089[2]	(See Ruby River)		
Poole Creek	1	320	8.000				
Spring Creek	1	200	5.000				
Spring Brook Creek	1	200	5.000				
Unnamed Spring	1	50	1.250				
Little Sage Creek or Little Spring Creek	15	2,470	61.750	1549	2	270	6.750
				3089[2]	(See Ruby River)		
Sheep Spring	1	50	1.250				
Caldwell Spring	1	40	1.000	See Ruby River			
Jasmine Creek	1	24	.600	See Ruby River			
Jasmine Spring	3	116,575	2,914.375				
Puller Hot Spring	1	All	——	See Ruby River			
Cottonwood Creek	12	5,825	145.625				
Morman Creek	5	915	22.875	See Ruby River			
Idaho Creek	7	2,525	63.125	See Ruby River			
Unnamed Springs	2	50	1.250				
Peterson Creek	6	380	9.500				
Garvey Creek	1	100	2.500				
Garden Creek	3	840	21.000	See Ruby River			
Barton Gulch	16	2,290	57.250	See Ruby River			
Elmo Spring	1	200	5.000				
Bear Creek	1	100	2.500				
Smith Spring	1	100	2.500				
South Spring	1	40	1.000				
Thompson Spring	1	20	.500				
Unnamed Spring	1	All	——				
Unnamed Springs	2	100	2.500				
Davey Creek	1	80	2.000				
Davis Gulch	1	30	.750				
Hinch Creek	2	12,000	300.000	See Ruby River			
Unnamed Creek	1	500	12.500				
Dryden or Sailor Creek	2	All	——	See Ruby River			
Williams Creek	22	1,850	46.250	1035	1	All	——
				3089[2]	(See Ruby River)		
Unnamed Spring	1	80	2.000				
Cook Springs	3	20	.500				
Pine Butte Creek	1	160	4.000				
Beach Creek	1	40	1.000				
Beach Canyon	1	60	1.500				
Wilcox Creek	1	60	1.500				
Alder Gulch Creek	21	1,200	30.000	1772	11	826.50	20.662
				3089[2]	(See Ruby River)		
				2041 & 2042	5	845	21.125

WATER RIGHT DATA—MADISON COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Daylight Gulch	8	54.13	1.353				
Spring Creek	1	All	——				
Bachelor Gulch Creek	12	2,360	59.000				
Spring Gulch	6	All	——				
Slaughter House Gulch	1	All	——				
Brown's Gulch	19	560	14.000				
Burton Gulch	1	10	.250				
Mill Creek	1	60	1.500				
Forks Spring	1	All	——				
Unnamed Springs	2	All	——				
Waste Water	1	All	——				
Cork Creek	1	All	——				
Butcher Gulch	9	920	23.000				
Saw Mill Creek	1	——	——				
Central Creek	1	All	——				
Linder Gulch	3	20	0.500				
Dan Williams Gulch	1	10	0.250				
French Gulch Creek	3	80	2.000				
French Louie Spring	1	10	0.250				
Granite Creek	36	3,615	90.375	See Ruby River			
West Fork Granite Creek	0	0	0	780	1	100	2.500
				3089[2]	(See Ruby River)		
Mill Gulch	6	1,375	34.375	See Ruby River			
Three Mile Creek	2	160	4.000				
Mapleton Spring	1	10	.250				
Velocipede Gulch	1	160	4.000				
Reis Spring	1	60	1.500				
Unnamed Creeks	2	——	——				
Sulphur Spring	1	All	——				
Park Spring	1	All	——				
Unnamed Springs	23	45	1.125				
2 Unnamed Lakes	1	All	——				
Swamp or Slough	1	120	3.000				
Waste Water	3	100	2.500				
Hungry Hollow	8	440	11.000				
Unnamed Spring	1	20	.500				
Copp Creek	1	120	3.000				
Laurin Canyon Creek	0	0	0				
Burnt Hollow Creek	1	40	1.000				
California Creek	3	450	11.500	1924	2	210	5.250
				3089[2]	(See Ruby River)		
Wakefield Creek	0	0	0				
Wakefield Gulch Spring	1	40	1.000				
Australia Gulch	1	40	1.000				
Harris Gulch or Creek	2	50	1.250	See Ruby River			
Quaking Asp Creek	6	765	19.125	See Ruby River			
Unnamed Creek	1	All	——				
Rock Spring	1	20	.500				
Bivins Creek	7	650	16.250	1685	2	300	7.500
				3089[2]	(See Ruby River)		

WATER RIGHT DATA—MADISON COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Branch Creek	0	0	0				
Unnamed Springs	2	100	2.500				
Ramshorn Creek	16	3,400	85.000	2176	13	1,884	47.100
				3089[2]	(See Ruby River)		
Curran Gulch	1	All	——				
Waste Water	2	All	——				
Horse Creek	3	All	——				
Spring Gulch	2	210	5.250				
East and West Springs	1	160	4.000				
Unnamed Spring	1	All	——				
Mill Creek	45	33,471	936.775	874	38	3,882	97.050
				3089[2]	(See Ruby River)		
Upper Lake	1	All	——				
Lower Lake	2	2,000	50.000				
Branham Lake	1	——	——				
Johnson Creek	1	All	——				
Johnson Lake	1	——	——				
Reed Creek	1	640	16.000				
Cow Canyon	1	40	1.000				
Quartz Hill Creek or Arastra	2	4,100	102.500	1442	1	160	4.000
				3089[2]	(See Ruby River)		
Bullion Gulch	1	10	.250				
Brandon Spring	1	All	——				
Unnamed Spring	2	50	1.250				
Mill Creek Slough	1	1,200	30.000	See Ruby River			
Waste Water	4	57	1.425				
Antelope Gulch	1	20	.500				
Forest Station Spring	1	20	.500				
Nonpareil Creek	0	0	0				
Park Spring	1	40	1.000				
Indian Creek	26	21,490	537.250	741	17	3,630	90.750
				3089[2]	(See Ruby River)		
Wood Gulch	2	240	6.000				
Spring Hollow Creek	0	0	0	1305	2	400	10.000
				3089[2]	(See Ruby River)		
Unnamed Creek	1	100	2.500				
Georgia Basin Spring	1	160	4.000				
Unnamed Springs	4	500	12.500				
Waste Water	1	3,000	75.000				
James Tuke Spring	1	1,000	25.0				
Davis Slough	2	All	——				
Wisconsin Creek	72	42,385	1,059.625	441	15	1,725	43.12
				3089[2]	(See Ruby River)		
Twin Lakes	2	2,000	50.0				
Toole Lake	1	All	——				
Mud Lake	1	40	1.0				
Surprise Lake	1	2,000	50.0				
Jackson Lake	1	40,000	1,000.0				
Nugget Gulch	7	1,820	45.50				
Independent Creek	1	500	12.50				

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Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Booth Creek	1	All	——				
Shovel Creek	1	325	8.15				
A Certain Spring	0	0	0	865	1	40	1.0
				3089[2]	(See Ruby River)		
Christenson Spring	1	500	12.50				
Unnamed Springs	1	310	7.75				
Waste Water	4	1,340	33.50				
Leonard Slough	0	0	0	2852	10	1,245	31.12
				3089[2]	(See Ruby River)		
Cedar Spring	1	200	5.0				
Mud Spring	1	200	5.0				
Unnamed Spring	1	——	——				
Warm Spring Creek	1	200	5.0				
Burns Gulch	1	100	2.50				
Wisconsin Gulch	3	500	12.50				
Unnamed Creek	1	500	12.50				
Wet Georgia Gulch	3	660	16.50				
Dry Georgia Gulch	2	120	3.0				
Jacobs Slough	1	All	——				
Unnamed Spring	1	200	5.0				
Waste Water	1	100	2.5				
Big Hole River	52	5,850,220	146,255.50	2725[1]	—	450	11.25
Stevens Slough	1	150	3.750				
Camp Creek	11	10,850	271.25	1134	12	1,525	38.12
Unnamed Spring	1	40	1.0				
Willow Creek	2	400	10.0	1134	(See Camp Creek)		
Choke Cherry Canyon	1	40	1.0				
Earl's Gulch	1	10	0.25				
Joe Brown's Gulch	1	All	——				
Brush Creek	1	All	——				
Gallagher Canyon Creek	1	30	0.75				
Lambert Creek	1	50	1.25				
Cottonwood Spring	1	40	1.0				
Little Star Spring Creek	1	75	1.87				
McCartney Creek	5	370	9.25				
Mud Spring	1	40	1.0				
Unnamed Creek	2	50	1.25				
Woolley Spring	1	All	——				
Baker Gulch	1	30	0.75				
Timber Canyon	1	80	2.0				
Park Gulch	1	30	0.75				
Schoolhouse Slough	3	550	13.75				
Pennington Spring	1	——	——				
Nez Perce Creek	0	0	0				
Lambert Spring	1	80	2.0				
Mud Spring	1	50	1.25				
Willow Spring	1	All	——				
Nez Perce Spring	2	320	8.00				
Schultz Spring	1	80	2.0				
Schwabacher Spring	1	80	2.0				
Nez Perce Hollow	1	2,000	50.0				

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APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Biven's Spring	1	50	1.25				
Cottonwood Spring	1	40	1.0				
Buffalo Spring	1	50	1.25				
Cedar Spring	1	25	0.63				
Rochester Creek	36	81,287	2,032.175				
Fisher Placer	1	All	——				
Steel Pass Creek	1	30	0.750				
Nippenberg Spring Creek	1	50	1.250				
Maloney Spring	1	6	0.150				
Unnamed Creek	1	30	0.750				
Unnamed Spring	9	415	10.375				
Waste Water	1	5	0.125				
Unnamed Spring	6	62	1.550				
Reservoir Slough	1	40	1.000				
Unnamed Slough	1	100	2.500				
Waste Water	1	150	3.750				
Cottonwood Creek	6	1,000	25.000				
Rock Spring	1	50	1.250				
Spring Creek	0	0	0				
Redfern Spring	1	120	3.000				
Dry Gulch Spring	1	100	2.500				
Round Grove Spring	1	All	——				
Goodrich Creek	13	1,670	41.750				
Twin Springs	1	200	5.000				
Libby Spring	1	50	1.250				
Unnamed Springs	2	40	1.000				
Dry Gulch	2	60	1.500				
Warm Spring Slough	1	200	5.000				
Berry Creek	1	200	5.000				
Swamp	1	400	10.000				
Bear Gulch or Creek	17	13,640	341.000	862	3	325	8.125
Unnamed Creek	1	50	1.250				
Bear Spring	1	100	2.500				
Hell Canyon Creek	13	1,664	41.600				
Billy John Spring	1	40	1.000				
Copper Flat Spring	1	40	1.000				
Tom Benton Gulch or Benton Gulch	4	All	——				
Ivanhoe Gulch	1	All	——				
Coal Creek	6	981	24.525				
Coal Canyon Spring	2	50	1.250				
Waste Water	1	10	.250				
Dry Boulder Creek	13	4,560	114.000	1427	5	2,760	69.00
Unnamed Spring	2	36	.900				
Waste Water	2	900	22.500				
Cherry Creek	7	630	15.750	857	5	414	10.35
Bell Gulch	1	All	——				
Pete Edward's Gulch	1	40	1.000				
Spring Gulch	1	100	2.500				
Unnamed Spring	1	500	12.500				
Little Cherry Creek	1	All	——				

WATER RIGHT DATA—MADISON COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Unnamed Spring	1	11	0.275				
Dry Creek	5	360	9.000				
Green Campbell Gulch	0	0	0				
Unnamed Spring	1	60	1.500				
Hell Roaring Creek	2	130	3.250				
Hulbert Canyon Creek	6	820	20.500	1230	3	330	8.25
Unnamed Spring	1	80	2.000				
Spring Reaf Creek	1	100	2.500				
Bumby Canyon	1	500	12.500				
Unnamed Spring	6	740	18.500				
Unnamed Creek	1	500	12.500				
Parson's Slough	2	700	17.500				
Spring Creek	6	355	8.875				
Beall Creek	12	4,850	121.250	668	5	360	9.0
Unnamed Lake	1	1,500	37.500				
Wickham Creek	2	2,100	52.500				
Unnamed Creek	1	All	——				
Fouts Spring	1	100	2.500				
Mill Canyon Creek	3	520	13.000				
Perry Canyon Creek	1	50	1.250				
Unnamed Creek	1	All	——				
Dunham Gulch	1	10	0.250				
Fish Creek	1	100	2.500	2221[5]	9	1,610	40.25
Point of Rocks Spring	2	20	.500				
Doyle's Spring	1	80	2.000				
Killham Spring	1	5	0.125				
Waste Water	2	500	12.500				
Hot Springs	1	500	12.500				
Pruett or Newberry Canyon Creek	3	300	7.500	943	1	40	1.0
Lone Tree Spring	1	40	1.000				
Cold Spring	1	10	0.250				
Mountain Spring	2	All	——				
Lost Spring	2	150	3.750				
Dixon Canyon Spring	1	50	1.250				
Lucky Dream Spring	1	20	.500				
Sunrise Spring	2	40	1.000				
Lane Spring	1	25	.625				
Midget Spring	2	All	——				
Crystal Spring	1	30	.750				
Water Canyon Creek	1	5	.125				
Copper Claim Gulch	1	100	2.500				
Mud Spring	1	400	10.000				
Mayflower or Cedar Hollow Gulch or Creek	3	1,400	35.000				
Limestone Spring	2	All	——				
Cedar Spring	2	600	15.000				
Saw Mill Spring	1	10	.250				
L'Esperance Spring	1	——	——				
Deep Gulch Spring	1	25	.625				
Peck Spring	1	30	.750				

WATER RIGHT DATA—MADISON COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Eleanor's Spring	1	2.23	.055				
Unnamed Spring	4	295	7.375				
Rocky Double Spring	1	40	1.000				
Hillside Spring	2	All	——				
Cabin Spring	1	4	0.100				
Swamp Creek	1	50	1.250				
Sacry Hollow Spring	1	50	1.250				
Wayne Spring	1	50	1.250				
George T. Sparrel Creek	1	75	1.875				
Noble Hollow Spring	1	100	2.500				
Unnamed Spring	1	40	1.000				
Spring Creek	1	All	——				
Hartwell Gulch	2	100	2.500				
South Boulder Creek	73	181,645	4,541.125	1827	71	7,012	175.30
				1951	1	400	10.0
Grass Lake	1	280	7.000				
Atlantic Placer	1	All	——				
Mammoth Lake	1	32,000	800.000				
Cataract Creek	2	1,060	26.500				
Camp Creek	4	8,720	218.000				
Curley Creek	4	4,100	102.500				
Park Creek	1	400	10.000				
Spring Creek	1	80	2.000				
McGovern Creek	1	1,000	25.000	1827	(See So. Boulder Creek)		
Unnamed Creek	1	100	2.500				
Saw Mill Creek	5	750	18.750				
Rocky Creek	5	2,750	68.750	1827	(See So. Boulder Creek)		
Morris Gulch	0	0	0	1827	(See So. Boulder Creek)		
Westmoreland Spring	1	50	1.250				
Bear Gulch	5	1,000	25.000				
Gans Spring	1	All	——				
Cedar Hollow Spring	2	110	2.750				
Canadian Creek Spring	2	300	7.500				
Brownback Gulch	0	0	0	1827	(See So. Boulder Creek)		
Unnamed Spring	1	60	1.500				
Uncle Ben Creek	1	60	1.500	1827	(See So. Boulder Creek)		
Cabin Spring	1	40	1.000				
Carmichael Creek	1	320	8.000	1827	(See So. Boulder Creek)		
Brook's Spring	1	10	0.250				
Unnamed Creek	2	All	——				
Morris Spring	2	100	2.500				
Unnamed Springs	4	580	14.500				
Waste Water	1	80	2.000				
Antelope Creek	15	2,480	62.000				
Hog Hollow Creek	1	60	1.500				
Reed Creek	1	80	2.000				
Wood Gulch	1	240	6.000				
Spring Gulch	1	60	1.500				
Wash Creek	6	430	10.750				
Wetzel Gulch	1	150	3.750				
Crystal Spring	2	50	1.250				
Unnamed Creeks	3	165	4.125				

WATER RIGHT DATA—MADISON COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Waste Water	1	All	——				
Dry Antelope Creek	4	530	13.250				
Dry Lake Gulch Creek	1	200	5.000				
Silver Springs	1	20	.500				
Unnamed Springs	2	320	8.000				
Sand Creek	11	300	7.500				
Cottonwood Creek	1	100	2.500				
Whippoorwill Creek	1	200	5.000				
Unnamed Springs	6	80	2.000				
Willow Creek	15	5,950	148.750	5591[3]	54	8,739	218.475
				6600[3]	1	100	2.500
Clipper Gulch or Creek	2	120	3.000				
Dry Hollow Creek	2	200	5.000				
Unnamed Creek	1	All	——				
Mud Spring	1	500	12.500				
Unnamed Spring	1	100	2.500				
Norwegian Creek	15	52,150	1,303.750	5591[3]	(See Willow Creek)		
Preacher Gulch Creek	1	80	2.000				
Unnamed Creek	1	100	2.500				
Red Spring	1	20	.500				
Canadian Creek	5	1,500	37.500				
Mud Spring	3	1,500	37.500				
Unnamed Spring	1	160	4.000				
Waste Water	3	480	12.000				
North Willow Creek	39	73,930	1,848.250	5591[3]	(See Willow Creek)		
Unnamed Lake	1	40	1.000				
Round Lake	1	200	5.000				
Jefferson Peak Lake	1	500	12.500				
Cataract Creek	16	6,496.5	162.412				
Gem Lake	1	All	——				
White Swan Lake	1	200	5.000				
Marsh Reservoir	1	All	——				
Quaking Asp Spring	1	40	1.000				
Unnamed Creek	2	580	14.500				
Wait Creek	1	All	——				
Twin Springs	2	4	.100				
Pony Creek	15	3,105	77.500	5591[3]	(See Willow Creek)		
Willow Spring	1	20	.500				
Charcoal Creek	6	575	14.375				
Charcoal Spring	1	50	1.250				
Strawberry Creek	10	680	17.000				
North Star Spring	1	50	1.250				
Unnamed Spring	2	60	1.500				
Creamery Spring	1	3	.075				
Woodward Spring	1	5	.125				
Brewery Spring	1	All	——				
Magpie Creek	3	85	2.125				
Unnamed Spring	4	190	4.750				
Webb Hollow Creek	2	70	1.750	5591[3]	(See Willow Creek)		
Waste Water	1	——	——				
Walter's Creek	1	400	10.000				
Quaking Asp Creek	1	1,000	25.000				

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APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
B. O. Pannell Spring	1	5	.125				
Spring Creek	1	150	3.750				
Hot Spring	1	All	——				
Phillips Creek	1	200	5.000				
Eldorado Spring	1	10	.250				
Unnamed Creeks	4	1,100	27.500				
Unnamed Spring	4	85	2.125				
Waste Water	4	360	9.000				
South Willow Creek	40	73,285	1,832.125	5591[3]	(See Willow Creek)		
Elk Lake	1	200	5.000				
Summit Lake	1	1,000	25.000				
Hidden Lake	1	All	——				
Spring Gulch	1	50	1.250				
Silver Spring Gulch	1	40	1.000				
Camp Creek	9	948	23.700				
Beckwith Creek	4	180	4.500				
Pete Creek	1	100	2.500				
Nigger Creek	1	100	2.500				
Tippecanoe Gulch	1	10	.250				
Unnamed Spring	1	100	2.500				
Waste Water	1	All	——				
Madison River	80	5,892,680	147,317.000	2931[1]	—	910	22.750
Eagle Gulch	1	60	1.500				
Libby Spring	1	200	5.000				
Sheep Creek	7	5,660	141.500	1840	4	1,110	27.750
Butte Creek	6	900	22.500				
Mile Creek	2	2,475	61.875	1345	2	800	20.000
Little Mile Creek	1	500	12.500				
Unnamed Spring	1	160	4.000				
Unnamed Spring	1	10	.250				
Keller Spring	3	500	12.500				
Snow Creek	4	1,420	35.500				
Unnamed Spring	1	All	——				
Trout Creek	3	600	15.000				
Sage Creek	1	200	5.000				
Dead Man's Creek	6	1,850	46.250				
Curlew or Cascade Creek	5	800	20.000				
Twin Spring	1	40	1.000				
West Fork Madison River	7	26,660	666.500				
Eureka Gulch	1	All	——				
McKenzie Spring	1	All	——				
Van Houser Creek	1	500	12.500				
Sloan Creek	1	30	.750				
Elk River	1	500	12.500				
Hell Roaring Creek	2	11,000	275.000				
Sink Creek	1	50	1.250				
Placer Creek	1	1,000	25.000				
Hutchin's Creek	1	5,000	125.000				
Iron Creek	1	1,600	40.000				
Lake Creek	1	1,000	25.000				
Wade Lake	0	0	0				
Wade Lake Spring	2	1,100	27.500				

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Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Cliff Lake	0	0	0				
Horn Creek	3	770	19.250				
Meed Spring	1	20	.500				
Horn Spring	1	50	1.250				
Spring Creek	1	120	3.000				
Antelope Creek	2	400	10.000				
Gazelle Creek	2	450	11.250				
Papoose Creek	11	6,790	169.750				
Squaw Creek	9	7,440	186.000				
Second Standard Creek	2	580	14.500				
Quaking Asp Creek	1	400	10.000	1357	2	205	5.125
Quaking Asp Spring	1	120	3.000				
Cottonwood Creek	3	2,080	52.000				
Moose Creek	8	4,680	117.000	1985	2	1,800	45.000
Bad Luck Creek	2	1,140	28.500				
Spring Creek	1	125	3.125				
Wall Creek	16	3,820	95.500				
Unnamed Spring	1	——	——				
Wolf Creek	37	36,060	901.500	1766	20	3,742	93.550
Stone Creek	1	40	1.000				
Wolf Creek Hot Springs	1	All	——				
Baker Spring	1	100	2.500				
Trail Creek	12	3,450	86.250				
Bob Cat Creek	1	40	1.000				
English George Creek	2	200	5.000	1682	2	255	6.375
Fresh Water Spring	1	40	1.000				
Hyde Creek	7	1,880	47.000				
South Fork Hyde Creek	1	All	——				
Nickerson Creek	0	0	0				
Conway Creek	1	280	7.000				
Curley Bill Creek	1	280	7.000				
Unnamed Creek	1	80	2.000				
Ruby Creek	17	5,950	148.750	1815	3	860	21.500
Deer Creek	0	0	0				
Unnamed Spring	1	80	2.000				
Pearson Creek	1	50	1.250				
Corral Creek	6	900	22.500				
Spring Creek	1	120	3.000				
Mud Spring	1	25	.625				
Willow Spring	1	30	.750				
Johnny Gulch	3	525	13.125				
Indian Creek	22	29,870	746.750	893	7	6,280	157.000
Macy Gulch Spring	1	All	——				
Unnamed Creek	3	All	——				
Cherry Gulch or Creek	4	400	10.000	1609	3	120	3.000
Rattlesnake Spring	2	80	2.000				
Morgan Creek	0	0	0				
Eureka Spring	1	80	2.000				
Sunrise Gulch	5	700	17.500				
Little Sunrise Spring	1	100	2.500				
Shingleton Spring	1	40	1.000				
Wigwam Creek	28	8,430	210.750	944	10	1,160	29.000

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Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Arasta or Arastra Creek	5	5,100	127.500				
Buffalo Creek	4	3,250	81.250				
Big Cottonwood Creek	1	1,500	37.500				
Unnamed Spring	1	20	.500				
Warm Spring Creek or Blaine Spring Creek	13	18,410	460.250	1185	6	2,825	70.625
Woodroad or Cold Spring Creek	0	0	0	1185	(See Warm Spring Creek)		
Cold Spring	1	20	.500				
Blaine Springs	1	2,000	50.000	2668	(See Warm Spring Creek)		
Spring Creek	1	——	——				
Moran Creek	7	All	——	651	2	250	6.250
First Lake	1	All	——				
Axolotl Creek	1	5,000	125.000				
Grass Lake	1	200	5.000				
Holly Creek	1	80	2.000				
Trail or English George Trail Creek	3	400	10.000	1171	1	All	——
Unnamed Spring	2	260	6.500				
Tanner's Spring	1	80	2.000				
Varney Spring	1	——	——				
Eight Mile Creek	2	240	6.000				
Unnamed Spring	1	10	.250				
O'Dell Creek	6	10,370	259.250				
Bear Creek	36	10,520	263.000	622	5	2,210	55.250
Little Bear Creek	1	——	——	2747	5	450	11.250
Dry Creek	2	260	6.500				
Spring Creek	1	100	2.500				
Dry Bear Creek	2	400	10.000				
Unnamed Creek	1	All	——				
Burger Creek	0	0	0				
Unnamed Spring	1	40	1.000				
Unnamed Creek	1	160	4.000				
Bear Spring	1	75	1.875				
Mill Creek (A Short Creek)	8	1,900	47.500	1659	2	1,470	36.750
Unnamed Spring	2	120	3.000				
Tolman Creek	5	490	12.250	3294	4	675	16.875
Shell Creek	3	695	17.375	1679	2	420	10.500
Unnamed Creek	2	400	10.000				
Waste Water	1	200	5.000				
Warm Springs Creek	0	0	0	1333	2	All	——
Cedar Creek	17	8,700	217.500	930	13	3,435	85.875
Postlewaite Creek	1	160	4.000				
McDeed Creek	2	370	9.250				
Jack Creek	22	11,330	283.250	853	16	3,376	84.400
Hutton Creek	1	200	5.000				
Unnamed Springs	3	160	4.000				
Waste Water	1	120	3.000				
Jordan or Jourdain Creek	6	1,260	31.500	1329	7	1,150	28.750
Lindsay Creek	1	400	10.000				
Watkins Creek	1	All	——	1329	(See Jordan Creek)		

WATER RIGHT DATA—MADISON COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Crooked Creek	1	All	——	1329	(See Jordan Creek)		
Short Creek	4	750	18.750	1329	(See Jordan Creek)		
Crockett Creek	1	200	5.000				
St. Joe Creek	3	600	15.000	566	2	200	5.000
Moores Creek	14	7,530	188.250	1402	14	5,990	149.750
Unnamed Spring	2	10	.250				
Postlewaite Creek	4	550	13.750	1402	(See Moores Creek)		
Bobtail Creek	1	50	1.250				
Slade Creek	3	All	——	1402	(See Moores Creek)		
Frieler Creek	4	1,220	30.500	1402	(See Moores Creek)		
Unnamed Spring	2	40	1.000				
Hungerford Spring	1	2	.050				
Garden Valley Creek	0	0	0				
Lewis Creek	1	80	2.000				
Haines Creek	1	100	2.500				
Trail Creek	1	100	2.500	1913	2	120	3.000
Spring Branch Creek	1	75	1.875				
Meadow Creek	8	12,700	317.500				
Bess Spring	1	50	1.250				
Unnamed Spring	3	81	2.025				
North Meadow Creek	39	22,550	563.750	1236	28	7,660	191.500
Seven Lakes	1	All	——				
Lake Spring	1	5,000	125.000				
Unnamed Lake	1	5,000	125.000				
Earl's Lake	2	2,000	50.000				
Ferguson Lake	1	500	12.500				
LaFonte Creek	1	160	4.000				
Peterson Creek	1	320	8.000				
Spring Creek	1	160	4.000				
Sure Shot Creek	6	2,340	58.500				
Washington Creek	16	11,960	299.000	1236	(See No. Meadow Creek)		
Washington Lakes	1	All	——				
Lakes and Ponds	1	All	——				
Sawlog Creek	1	200	5.000	1236	(See No. Meadow Creek)		
Aurora Creek	1	200	5.000	1236	(See No. Meadow Creek)		
Unnamed Spring	1	150	3.750				
Adkins Spring	1	All	——				
Unnamed Spring	1	All	——				
South Meadow Creek	21	15,565	389.125	1183	22	4,055	101.375
Leonard Creek	4	630	15.750	1183	(See So. Meadow Creek)		
Dry Leonard Creek	1	40	1.000	1183	(See So. Meadow Creek)		
Waste Water	1	20	.500				
Trail Creek	3	100	2.500				
Big Sheep Gulch Spring	1	50	1.250				
Bear Trap Creek	4	4,160	104.000				
Cold Spring Creek	1	280	7.000				
Cold Spring	1	100	2.500				
Whitney Creek	1	450	11.250				
Hot Spring Creek	27	8,110	202.750	1122	11	1,075	26.875
Upper Hot Spring	2	50	1.250				
Pony Gulch or Creek	4	300	7.500				
Silver Spring	1	10	.250				

WATER RIGHT DATA—MADISON COUNTY
APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Christman Creek	1	50	1.250				
Unnamed Spring	2	80	2.000				
Sheep Creek	1	50	1.250				
Bradley or Burnt Creek	4	390	9.750	1122	(See Hot Spring Creek)		
Monepa Creek	1	80	2.000				
Unnamed Spring	3	100	2.500				
Woods Creek	1	All	——	1122	(See Hot Spring Creek)		
Crowley Spring	1	10	.250				
Lower Hot Spring	1	10	.250				
Ivanhoe Gulch	1	100	2.500				
Boaz Gulch or Creek	4	45	1.125				
Boaz Spring	2	13	.325				
Crystal Spring	1	10	.250				
Silver Spring	3	All	——				
Unnamed Creek	1	All	——				
Cottonwood Creek	1	30	.750				
Red Bluff Creek	2	All	——				
Waste Water	2	140	3.500				
Little Cottonwood Creek	1	——	——				
Cherry Creek	21	13,200	330.000				
Muelhan Gulch	1	160	4.000				
Carpenter Creek	1	40	1.000				
Beaver Creek	4	9,800	245.000				
Mill Creek	0	0	0				
Pittsburg Creek	1	100	2.500				
Deep Creek	1	All	——				
Elk Mountain Spring	1	All	——				
Van Akin Spring	1	10	.250				
Pole Creek	5	150	3.750				
Wild Cat Gulch	1	150	3.750				
Unnamed Spring	1	All	——				
Spring Creek	1	All	——				
Elk Creek	4	1,500	37.500				
Lake Basin Creek	1	150	3.750				
Nelson Creek	1	150	3.750				
Spring Creek	1	100	2.500				
Gallatin River	0	0	0				
West Gallatin River	0	0	0	3850[3]	233	96,889.4	2,422.235
Spanish Creek	5	2,520	63.000	3850[3]	(See W. Gallatin River)		
North Fork Spanish Creek	4	30,550	763.750	3850[3]	(See W. Gallatin River)		
Placer Creek	1	160	4.000				
Willow Swamp Creek	2	350	8.750				
Vogel Spring	1	All	——				
Unnamed Creek	1	200	5.000				
South Fork Spanish Creek	2	530	13.250	3850[3]	(See W. Gallatin River)		
Bee Hive Creek	1	500	12.500	3850[3]	(See W. Gallatin River)		
Dry Creek	1	100	2.500				
TOTAL:	2550	14,031,217	350,873.595	——	955	283,820.65	7,095.500

WATER RIGHT DATA—MADISON COUNTY
APPROPRIATIONS AND DECREES BY STREAMS

Streams	Appropriations (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	Decreed Rights Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Drainage in Madison County not located:							
Alkali Spring	1	1,000	25.000				
Aspole Creek	1	All	——				
Big Spring	1	——	——				
Big Mud Creek	1	All	——				
Blair Spring	1	40	1.000				
Buck Creek	1	320	8.000				
Cales Creek	1	All	——				
Camp Creek	6	800	20.000				
Coldwater Spring	1	20	.500				
Correll Creek	1	400	10.000				
Cottonwood Gulch	2	All	——				
Cottonwood Spring	1	6	.150				
Crystal Spring	1	40	1.000				
Ditch Creek	2	800	20.000				
Dry Creek	1	40	1.000				
Dry Gulch	1	200	5.000				
Fairview Spring	1	All	——				
Fruin Spring	1	50	1.250				
Frye Creek	1	200	5.000				
Hagerty Spring	1	10	.250				
High Ridge Spring	1	15	.375				
Humboldt Spring	1	All	——				
King Spring	1	50	1.250				
Le Foy Creek	1	600	15.000				
Mathers Lake	1	1,000	25.000				
Mud Spring	1	150	3.750				
McConnell Gulch	2	——	——				
No. 1 Pond	1	700	17.500				
No. 2 Pond	1	700	17.500				
Nugget Gulch	4	——	——				
Picnic Spring	1	720	18.000				
Pine Butte Creek	1	160	4.000				
Robinson Gulch	1	——	——				
Smith Creek	1	All	——				
Sparrow Slough	1	500	12.500				
3 Small Lakes	1	All	——				
Unnamed Creek	4	All	——				
Unnamed Spring	5	3,160	79.000				
Yukon Creek	1	900	22.500				
Waste Water	1	All	——				
TOTAL	58	12,581	314.525				

(1) A "Ditch Decree" which defines from the stream the capacity and water rights of a particular ditch system.

(2) Pending decree of the "Ruby River and Tributaries," Case No. 3089. In its present form this decree does not include all rights of the tributary streams previously decreed as noted.

(3) Located in Gallatin County Courthouse, Bozeman, Montana.

(4) Located in Beaverhead County Courthouse, Dillon, Montana.

(5) Located in Jefferson County Courthouse, Boulder, Montana.

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